



United States Environmental Protection Agency
Washington, DC 20460

Completion Form For Injection Wells

Administrative Information

1. Permittee

Florence Copper Inc.

Address (Permanent Mailing Address) (Street, City, and ZIP Code)

1575 W Hunt Hwy, Florence, AZ 85132

2. Operator

Florence Copper Inc.

Address (Street, City, State and ZIP Code)

1575 W Hunt Hwy, Florence, AZ 85132

3. Facility Name

Florence Copper Inc.

Telephone Number

(520) 374-3984

Address (Street, City, State and ZIP Code)

1575 W Hunt Hwy, Florence, AZ 85132

4. Surface Location Description of Injection Well(s)
State

Arizona

County

Pinal

Surface Location Description

SW 1/4 of SW 1/4 of NE 1/4 of SW 1/4 of Section 28 Township 4S Range 9E

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location 1080 ft. frm (N/S) N Line of quarter section
and 1135 ft. from (E/W) E Line of quarter section.

Well Activity
Well Status
Type of Permit

- Class I
- Class II
- Brine Disposal
- Enhanced Recovery
- Hydrocarbon Storage
- Class III
- Other

- Operating
- Modification/Conversion
- Proposed

- Individual
- Area : Number of Wells 33

Lease Number NA

Well Number R-09

Submit with this Completion Form the attachments listed in Attachments for Completion Form.

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)

Ian Ream, Senior Hydrogeologist

Signature

Date Signed

9-12-2018

PAPERWORK REDUCTION ACT

The public reporting and record keeping burden for this collection of information is estimated to average 49 hours per response for a Class I hazardous facility, and 47 hours per response for a Class I non-hazardous facility. Burden means the total time, effort, or financial resource expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

Attachments to be submitted with the Completion report:

I. Geologic Information

1. Lithology and Stratigraphy

A. Provide a geologic description of the rock units penetrated by name, age, depth, thickness, and lithology of each rock unit penetrated.

B. Provide a description of the injection unit.

- (1) Name
- (2) Depth (drilled)
- (3) Thickness
- (4) Formation fluid pressure
- (5) Age of unit
- (6) Porosity (avg.)
- (7) Permeability
- (8) Bottom hole temperature
- (9) Lithology
- (10) Bottom hold pressure
- (11) Fracture pressure

C. Provide chemical characteristics of formation fluid (attach chemical analysis).

D. Provide a description of freshwater aquifers.

- (1) Depth to base of fresh water (less than 10,000 mg/l TDS).
- (2) Provide a geologic description of aquifer units with name, age, depth, thickness, lithology, and average total dissolved solids.

II. Well Design and Construction

- 1. Provide data on surface, intermediate, and long string casing and tubing. Data must include material, size, weight, grade, and depth set.
- 2. Provide data on the well cement, such as type/class, additives, amount, and method of emplacement.
- 3. Provide packer data on the packer (if used) such as type, name and model, setting depth, and type of annular fluid used.

4. Provide data on centralizers to include number, type and depth.

5. Provide data on bottom hole completions.

6. Provide data on well stimulation used.

III. Description of Surface Equipment

1. Provide data and a sketch of holding tanks, flow lines, filters, and injection pump.

IV. Monitoring Systems

1. Provide data on recording and nonrecording injection pressure gauges, casing-tubing annulus pressure gauges, injection rate meters, temperature meters, and other meters or gauges.

2. Provide data on constructed monitor wells such as location, depth, casing diameter, method of cementing, etc.

V. Logging and Testing Results

Provide a descriptive report interpreting the results of geophysical logs and other tests. Include a description and data on deviation checks run during drilling.

VI. Provide an as-built diagrammatic sketch of the injection well(s) showing casing, cement, tubing, packer, etc., with proper setting depths. The sketch should include well head and gauges.

VII. Provide data demonstrating mechanical integrity pursuant to 40 CFR 146.08.

VIII. Report on the compatibility of injected wastes with fluids and minerals in both the injection zone and the confining zone.

IX. Report the status of corrective action on defective wells in the area of review.

X. Include the anticipated maximum pressure and flow rate at which injection will operate.

TECHNICAL MEMORANDUM

14 September 2018

File No. 129687-010

TO: Florence Copper Inc.
Ian Ream, Senior Hydrogeologist

FROM: Haley & Aldrich, Inc.
Lauren Candreva, R.G.

Subject: Drilling, Installation, and Integrity Testing Summary
PTF Recovery Well R-09
Florence Copper Inc., Florence, Arizona



This document summarizes the drilling, installation, and testing of Production Test Facility (PTF) recovery well R-09 for Florence Copper Inc. (Florence Copper) in Florence, Arizona, including the equipment used to perform the work, completion, and the results of well testing activities. Separate well completion reports have been created for each PTF well.

The Arizona Department of Water Resources Registry ID for well R-09 is 55-227708 and the Well Registry Report is included in Appendix A. Well R-09 is located in the southwest quarter of the northeast quarter of the southwest quarter of Section 28 of Township 4 north, Range 9 East of the Gila and Salt River Baseline and Meridian (D(4-9)28CAC). Well R-09 is located within the Underground Injection Control (UIC) Permitted Area of Review (AOR) for UIC Permit R9UIC-AZ3-FY11-1 and was completed as a Class III recovery well for the PTF (Figure 1).

Florence Copper contracted Hydro Resources, Inc. (Hydro Resources) to drill, install, and test recovery well R-09 in accordance with *Well Specification: Drilling, Installation, and Testing of Class III Injection and Recovery Wells, Production Test Facility, Florence, Arizona* (Haley & Aldrich, Inc. [Haley & Aldrich], 2017). A Challenger 280 drilling rig was used for all drilling and construction activities. Haley & Aldrich provided oversight of drilling activities, geophysical logging, well installation, and testing. All reported depths are in feet below ground surface unless otherwise noted.

I. Geologic Information

1. Lithology and Stratigraphy

A. Geology of Penetrated Units

The geology penetrated during the drilling of the Class III well R-09 is summarized in the table below and a lithologic log is included in Appendix B.

Lithologic Unit Name	Depth to Bottom of Unit (feet)	Thickness of Unit (feet)	Lithology and Age of Unit
Upper Basin Fill Unit (UBFU)	283	283	Alluvium; Quaternary to Tertiary
Middle Fine-Grained Unit (MFGU)	301	18	Alluvium; Tertiary
Lower Basin Fill Unit (LBFU)	378	77	Alluvium; Tertiary to Cretaceous
Bedrock Oxide Unit (Oxide)	Not encountered	>858	Igneous porphyry – Precambrian

B. Description of Injection Unit

Name	Bedrock Oxide Unit
Depth Drilled	1,236 feet
Thickness	>858 feet
Formation Fluid Pressure	Atmospheric plus head of freshwater – no additional formation pressure
Age of Unit	Precambrian with intrusions of Precambrian to Tertiary rocks
Porosity ¹	Approximately 6 to 8.5%
Permeability	Hydraulic Conductivity = 0.56 feet per day
Bottom Hole Temperature	28.97 degrees Celsius
Lithology	Igneous porphyry – quartz monzonite, granodiorite with diabase and andesite dykes (detailed log included in Appendix B)
Bottom Hole Pressure	Approximately 430 pounds per square inch (PSI) (pressure exerted by the column of freshwater with no additional contribution from formation pressure)
Fracture Pressure	0.65 PSI per foot

¹ Porosity values for the bedrock oxide unit are approximate values from calculated neutron porosity values from injection well borehole surveys.

C. Chemical Characteristics of Formation Fluid

The chemical characteristics of the formation fluid in the injection zone are summarized below and are the results of the sampling of the center PTF wellfield well R-09. The table below summarizes the primary chemical characteristics detected in a formation fluid sample collected on 23 April 2018; the complete analytical report is included in Appendix C.

Analyte	Result (mg/L)
Metals	
Aluminum	<0.08
Antimony	<0.005
Arsenic	0.0016
Barium	0.071
Beryllium	<0.0005
Cadmium	<0.00025
Calcium	140
Chromium	0.0051
Cobalt	<0.00025
Copper	0.011
Iron	<0.30
Lead	<0.0005
Magnesium	27
Manganese	0.002
Mercury	<0.001
Nickel	0.0033
Potassium	6.8
Selenium	<0.0025
Sodium	170
Thallium	<0.0005
Zinc	<0.04
Anions	
Bicarbonate	150
Chloride	310
Fluoride	<0.5
Nitrate	8.8
Sulfate	190
Field Parameters	
Total Dissolved Solids	1,000
pH	7.8
Radiochemicals	
Uranium	0.016
Notes:	
mg/L = milligrams per liter	

Sampling results for well R-09 are included in the *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings* (Brown and Caldwell, 2018).

D. Description of Freshwater Aquifers

- 1) The depth to the base of the freshwater aquifer is defined by the interface where deeper formation fluid exhibits a total dissolved solids (TDS) value of 10,000 milligrams per liter (mg/L). The depth of the 10,000 mg/L interface is deeper than all of the wells drilled at the site, and consequently, has not been defined.
- 2) The geologic description of the aquifer units is included below:

Aquifer Unit Name	Age	Depth	Thickness (feet)	Lithology	Average Total Dissolved Solids ¹ (mg/L)
UBFU	Quaternary/Tertiary	0 to 283	283	Alluvium	914
LBFU	Tertiary	301 to 378	77	Alluvium	754

Notes:
¹ Average TDS values calculated from UBFU and LBFU monitoring well ambient monitoring results near the PTF.

II. Well Design and Construction

1. Well R-09 Casing Installed:

Casing	Material	Diameter (inches)	Weight (pounds per foot)	Depth (feet)	Borehole Diameter (inches)	Drilling Method
Surface	Mild Steel	26 O.D. 25½ I.D.	102.72	0 to 40	36	Solid-stem auger
Overburden (intermediate)	Mild Steel – bottom 40 feet poly coated	16 O.D. 15½ I.D.	56.57	0 to 497	24	Reverse flooded rotary
Well Casing	Fiberglass Reinforced Plastic	8.46 O.D. 7.74 I.D.	8.20	-1.9 to 520	Inside overburden casing to 497 feet; 14	Inside overburden casing/reverse flooded rotary
Screen	PVC SCH80 with 0.080-inch wide slots	8.63 O.D. 7.63 I.D.	7.63	520 to 658 676 to 892 910 to 1,205	14	Reverse flooded rotary
Blank Intervals	Stainless Steel SCH40 – Type 316L	8.63 O.D. 7.99 I.D.	28.58	658 to 676 892 to 910	14	Reverse flooded rotary

Notes:
I.D. = inside diameter
O.D. = outside diameter

PVC = polyvinyl chloride
SCH = Schedule

2. Well Cement

Cement Interval	Cement Type	Additives	Amount Installed (cubic yards)	Method of Emplacement
Surface Casing	Type V Neat 21 sack slurry	None	4.5	Submerged tremie
Overburden Casing	Type V Neat 21 sack slurry	None	30.5	Displacement - installed through drillable grout shoe with one-way stab-in valve, welded to the bottom of the casing
Well Casing	Type V Neat 21 sack slurry	None	19.8	Submerged Tremie

Field forms documenting pipe tallies, annular materials, and cement tickets are included in Appendix D.

3. Annular Packers

No annular packers were used during construction of well R-09.

4. Centralizers

Casing	Centralizer Type	Number and Spacing
Overburden	Mild Steel – welded	13 installed – every 40 feet
Well – FRP and PVC	Stainless steel – Heavy Duty	31 installed – every 40 feet
Notes: <i>FRP = fiberglass reinforced plastic</i> <i>PVC = polyvinyl chloride</i>		

5. Bottom Hole Completion

There is no bottom hole completion as this is not an oil/gas well. The well was completed at the bottom with a stainless-steel endcap of the same diameter as the well screen.

6. Well Stimulation

No well stimulation was used during the drilling and construction of well R-09.

III. Description of Surface Equipment

1. Surface Equipment

Well R-09 is a recovery well and has been equipped with a submersible pump. The 2-inch diameter discharge pipe extends from the well head and into the manifold that conveys the fluid directly to the solvent extraction/electrowinning plant on-site. A diagram of the wellhead is included as Figure 2.

IV. Monitoring Systems

1. Well Monitoring Equipment

Equipment Type	Location	Type	Purpose
Annular Pressure Transducer	Well Annulus – 635 feet bgs	Recording	Monitor water column/pressure
Pressure Transducer	Well Casing – approx. 400 feet bgs	Recording	Monitor water column/pressure
Flow Meter	Wellhead	Recording	Monitor extraction rate
Pressure Gauge	Wellhead	Nonrecording	Monitor wellhead pressure
Notes: <i>bgs = below ground surface</i>			

2. Monitoring Wells

There are a total of 16 monitoring wells associated with the PTF: 7 point-of-compliance (POC) wells, 7 United States Environmental Protection Agency (USEPA) supplemental monitoring wells, and 2 operational monitoring wells. The POC wells are located outside the AOR and are not constructed as Class III wells. The supplemental monitoring and operational monitoring wells are located within the AOR and are constructed as Class III wells as required by the UIC Permit. The wells are summarized in the tables below by type.

POC Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M14-GL	846750.23 746461.52	859	5 9/16 OD	Submerged tremie	778 to 838	LBFU
M15-GU	846697.17 746464.82	615	5 9/16 OD	Submerged tremie	554 to 594	LBFU
M22-O	846751.26 746514.47	1,140	5 9/16 OD to 528 feet; 4 1/2 OD to 1,140 feet	Submerged tremie	932 to 1,130	Oxide

POC Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M23-UBF	846688.13 746512.48	250	6 5/8 OD	Submerged tremie	210 to 250	UBFU
M52-UBF	851092.00 774178.00	274	5 9/16	Submerged tremie	198 to 273	UBFU
M54-LBF	847331.96 746682.61	630	5 9/16	Submerged tremie	310 to 629	LBFU
M54-O	847342.99 746702.36	1,199	5 9/16	Submerged tremie	668 to 1,198	Oxide

OD = outside diameter

Supplemental Monitoring Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M55-UBF	847541.46 746280.63	261	5	Submerged tremie	240 to 260	UBFU
M56-LBF	847518.70 746303.41	340	5	Submerged tremie	320 to 340	LBFU
M57-O	847378.37 746248.93	1,200	5	Submerged tremie	523 to 1,199	Oxide
M58-O	847672.23 746595.97	1,200	5	Submerged tremie	594 to 1,199	Oxide
M59-O	847934.95 746218.89	1,201	5	Submerged tremie	534 to 1,199	Oxide
M60-O	847599.37 745903.70	1,201	5	Submerged tremie	444 to 1,200	Oxide
M61-LBF	848184.46 746148.88	629	5	Submerged tremie	429 to 629	LBFU

Operational Monitoring Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval	Screened Lithologic Unit
MW-01-LBF	847487.97 746360.54	444	5	Submerged tremie	330 to 440	LBFU
MW-01-O	847499.04 746369.31	1,200	5	Submerged tremie	500 to 1,200	Oxide

V. Logging and Testing Results

Borehole geophysical logging was conducted on well R-09 in four phases: 1) open-hole surveys in the 20-inch borehole prior to installation of the overburden casing; 2) cased-hole surveys in the 14-inch casing; 3) open-hole surveys in the 12.25-inch borehole prior to installation of the well casing and screen; and 4) cased-hole surveys in the completed well.

The open-hole geophysical surveys completed at well R-09 included:

- Spontaneous potential;
- Natural gamma;
- Electrical resistivity (short and long normal);
- Neutron;
- Caliper with calculated volume;
- Temperature;
- Sonic; and
- Deviation.

The cased-hole geophysical surveys completed included:

- Cement bond log (overburden steel casing);
- Very large borehole (VLB) acoustic (overburden steel casing);
- Sonic (for cement bond with fiberglass reinforced plastic [FRP]);
- 4 Pi Density (for cement bond with FRP);
- Dual Density (for cement bond with FRP);
- Natural Gamma;
- Fluid Conductivity;
- Temperature;
- Gyroscopic Deviation Survey; and
- Video Survey.

Open-hole geophysical surveys were used to support identification of the lithologic contacts, to evaluate the condition of the borehole, and to evaluate the deviation of the borehole.

The primary logs used to evaluate lithologic contacts are natural gamma ray, short (16-inch) and long (64-inch) normal electrical resistance, and single-point resistance. The lithologic contacts for the Middle Fine-Grained Unit (MFGU) were selected based on the short and long resistance and the single-point resistance. All the resistivity logs decreased and stayed consistently low through the MFGU. This contact is generally a relatively sharp decrease in resistance at the top of the unit and a gradual increase in resistance below the bottom of the unit.

The contact between the Lower Basin Fill Unit (LBFU) and the bedrock was identified primarily with natural gamma and correlated with the resistance logs. There is a consistent increase in gamma at the contact between the LBFU and the bedrock that had been identified and documented at the site during exploration in the 1990s. For well R-09, the gamma is consistently at approximately 65 American Petroleum Institute (API) units throughout the Upper Basin Fill Unit (UBFU) and MFGU, a slight increase to approximately 75 API units in the LBFU, and an increase at 378 feet to over 120 API units. After the increase at 378 feet, the natural gamma begins to vary significantly more than it did in the alluvial units. This change in the response of the natural gamma indicates the contact with the bedrock unit. Also, at this approximate depth the resistance increases gradually which is likely due to bedrock containing less water causing a generally increased resistivity.

Cased-hole geophysical surveys were conducted to evaluate the cement seal and casing-cement bond, to document baseline fluid temperature and conductivity, and to evaluate the plumbness of the well. The cement-bond is discussed in Section VII.

Copies of all the open-hole geophysical logs and cased-hole temperature, fluid conductivity, and natural gamma are included in Appendix E; a figure summarizing the open-hole logs used to evaluate geology is included as Figure 3. The cased-hole logs used to evaluate cement bond are included in Appendix F.

VI. Well As-Built Diagram

A diagram showing the wellhead completion for well R-09 is included as Figure 2. A well as-built diagram for well R-09 is included as Figure 4.

VII. Demonstration of Mechanical Integrity

A demonstration of Part I mechanical integrity of the well was completed using a standard annular pressure test (SAPT) in accordance with Part II.E.3.a.i.A of the UIC Permit. Mechanical integrity will be demonstrated every 2 years during operations and will be confirmed by daily injection pressure monitoring that will be conducted per the UIC Permit once the well is operational. Well R-09 SAPT is summarized below.

The mechanical integrity of the blank well casing was tested by performing a SAPT on 24 April 2018. The SAPT was conducted by installing an inflatable straddle packer assembly in the well. The bottom packer was installed near the bottom of the FRP-cased portion of the well and the top packer was near the surface, the packers were inflated to form a seal against the casing. The bottom 5 feet of the packer drop pipe was perforated to allow for communication between the tubing and the annulus of the packer assembly. The drop pipe extended through the wellhead and a high pressure/low volume pump was attached to the drop pipe to pressurize the test interval. A valve on the drop pipe at the surface was used to isolate the test interval once the planned test pressure was achieved.

An In-Situ LevelTROLL® pressure transducer with a data logger was installed at the well head and was connected to the packer assembly annulus interval via a National Pipe Thread (NPT) adapter. The LevelTROLL was used to monitor and record pressure inside the well during the SAPT. To conduct the SAPT, water was pumped from a nearby well immediately prior to testing. Before the water was pumped into the test well, the water temperature was measured to ensure that it was similar to the ambient groundwater temperature of the test well to reduce the potential of differential temperature effects on the well casing. The SAPT for the Class III well was conducted by applying hydraulic pressure to well casing and shutting in pressure between the packer and wellhead assembly, monitoring the shut-in pressure for a 30-minute period, then measuring the volume of water returned from the well casing after the pressure was released.

On 24 April 2018, the packer was installed to approximately 507 feet and the SAPT was conducted successfully three times. The USEPA SAPT form, a table of the data, and a chart of the data is provided in Appendix G.

Part II mechanical integrity is demonstrated by the cementing records included in this report (in accordance with Part II.E.3.ii.C of the UIC Permit) and will be demonstrated during operations by annular conductivity monitoring on the observation and multi-level sampling wells (in accordance with Part II.E.3.a.ii.A of the UIC Permit).

Cemented Interval	Cement Type	Calculated Grout Volume (cubic yards)	Installed Grout Volume (cubic yards)
Surface Casing	Type V 21 sack neat cement slurry	2.6	4.5
Overburden Casing	Type V 21 sack neat cement slurry	30	30.5
Well Casing	Type V 21 sack neat cement slurry	19.4	19.8

On 28 December 2017, a cement bond log was run on the overburden casing. On 26 April 2018, a suite of logs was run over the entire length of the completed well to verify the grout seal; a summary of the geophysical logs completed to demonstrate cement bond are included in Appendix F.

The cement bond of the steel casing was evaluated by the geophysical contractor by calculating a bond index. The bond index was calculated to be an average of 66 percent over the cement grouted interval from 7 to 498 feet. This data is included on the summary log in Appendix G. Because the bond index for well R-09 was lower than other wells at the PTF, a very large borehole (VBL) geophysical tool was run to investigate any potential deficiencies. The VBL data was used to generate a Cement Attenuation Decay Index (CADI) which is displayed on the well summary for R-09 included in Appendix F. The CADI data could only be collected to approximately 460 feet due to interference with mud in the casing. Analysis of the CADI data by the geophysical subcontractor indicated that although the bond index is low, the consistent density and CADI data indicate there is uniform cement present with no grout channels at well R-09.

There is not a bond log tool designed to evaluate cement bond with FRP casing, so the cement interval with FRP casing was evaluated using density logs. The logs collected included sonic and 4pi density. Based on the measured density of the FRP cased interval of R-09, no significant cement deficiencies were noted in the sonic data collected from approximately 232 feet (static water level) to 499 feet, and no significant deficiencies were noted in the 4pi density data collected from 15 to 499 feet. There were some very localized, low density intervals identified in the 4pi density logs but they were insignificant, only extending 2 to 3 feet. A summary of the FRP cased data is included in the well completion summary in Appendix G.

VIII. Compatibility of Injected Waste

The Florence Copper Project is a Class III mineral extraction project and does not include the injection of any waste products of any kind. The injected fluid (lixiviant) is a carefully constituted in-situ copper recovery solution that will be recovered and recycled following injection.

The compatibility of the lixiviant was evaluated as part of the geochemical modeling completed by Florence Copper and summarized in the *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona* (Daniel B. Stephens Inc., 2014) which was included in Attachment H of the UIC Permit Application.

IX. Status of Corrective Action on Defective Wells in the Area of Review

There are not currently any defective wells in the AOR.

X. Maximum Pressures and Flow Rates for R-09

Maximum Operating Pressure	Maximum Flow (Extraction)
Atmospheric	No maximum extraction flow

This well is a recovery well used to extract solution; there is no maximum flow. However, in accordance with Section 2.2.1.1 of the Aquifer Protection Permit (APP), the recovery rate for the entire wellfield must always exceed the injection rate on a daily average, and in accordance with Part II.E.5.a of the UIC Permit the recovery rate will not fall below 110 percent of the injection rate on a daily average.

XI. Well Development

Well R-09 was developed by the airlift method, followed by pumping, and was completed by Hydro Resources using a workover rig. To purge drilling fluids and solids, the well was airlift developed from

16 to 22 April 2018 at depths ranging from 400 to 1,200 feet. During development, the airlift pump was turned on and off to surge the well. On 22 April 2018, approximately 55 gallons of chlorine were added to the well. To pump develop the well, a submersible pump was temporarily installed at approximately 1,160 feet on 23 April 2018. Pump development was conducted at 50 to 60 gallons per minute (gpm) on 23 April 2018, during which time the submersible pump was raised to 900 feet and 600 feet and periodically turned off to surge the well. The discharge was visually clear throughout the pump development period, and turbidity values were less than 2 Nephelometric Turbidity Units at the end of the development period. Well development forms are included in Appendix H.

XII. Well Completion

A well video survey was conducted on 6 May 2018; the video log report is included as Appendix I. The video log depths are presented in feet below the top of the casing and thus vary slightly from what is recorded; however, these values are the same with the correction for stick up.

The video log indicates the total depth reached was 1,192 feet.

A gyroscopic survey was also conducted on the completed well on 7 April 2018; the results are included in Appendix I.

The surveyed location for well R-09 is:

Northing (feet)	Easting (feet)	Measuring Point Elevation (feet amsl)
746132.08	847694.65	1479.62

Notes:
*Northing and easting locations provided in State Plane North American Datum 1983, vertical location provided in North American Vertical Datum 1988.
amsl – feet above mean sea level*

XIII. Downhole Equipment

On 28 June 2018, the permanent pump equipment was installed in the well. The equipment installed included the following:

- Wilo 12.5 horsepower pump – intake at 687 feet;
- 6-inch inflatable packer installed from 669 to 672 feet;
- 2-inch Schedule 120 threaded and coupled polyvinyl column pipe with 316L stainless steel couplers from the pump to approximately 500 feet;
- 2-inch Schedule 40 threaded and coupled 316L stainless steel column pipe with 316L stainless steel couplers from approximately 500 feet to the wellhead;

- 316L braided stainless steel safety cable was installed from the pump to the wellhead;
- Pressure transducer; and
- 1-inch nominal diameter sounding tube.

The type and depth of equipment installed in each well is not constrained by the UIC Permit or the APP. This information is provided in accordance with Section 2.7.4.3 of the APP. Operational consideration may require that the type and depth of equipment may need to be changed in response to conditions observed during operations.

XIV. References

Brown and Caldwell, Inc., 2018. *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings*. Prepared for Florence Copper. August.

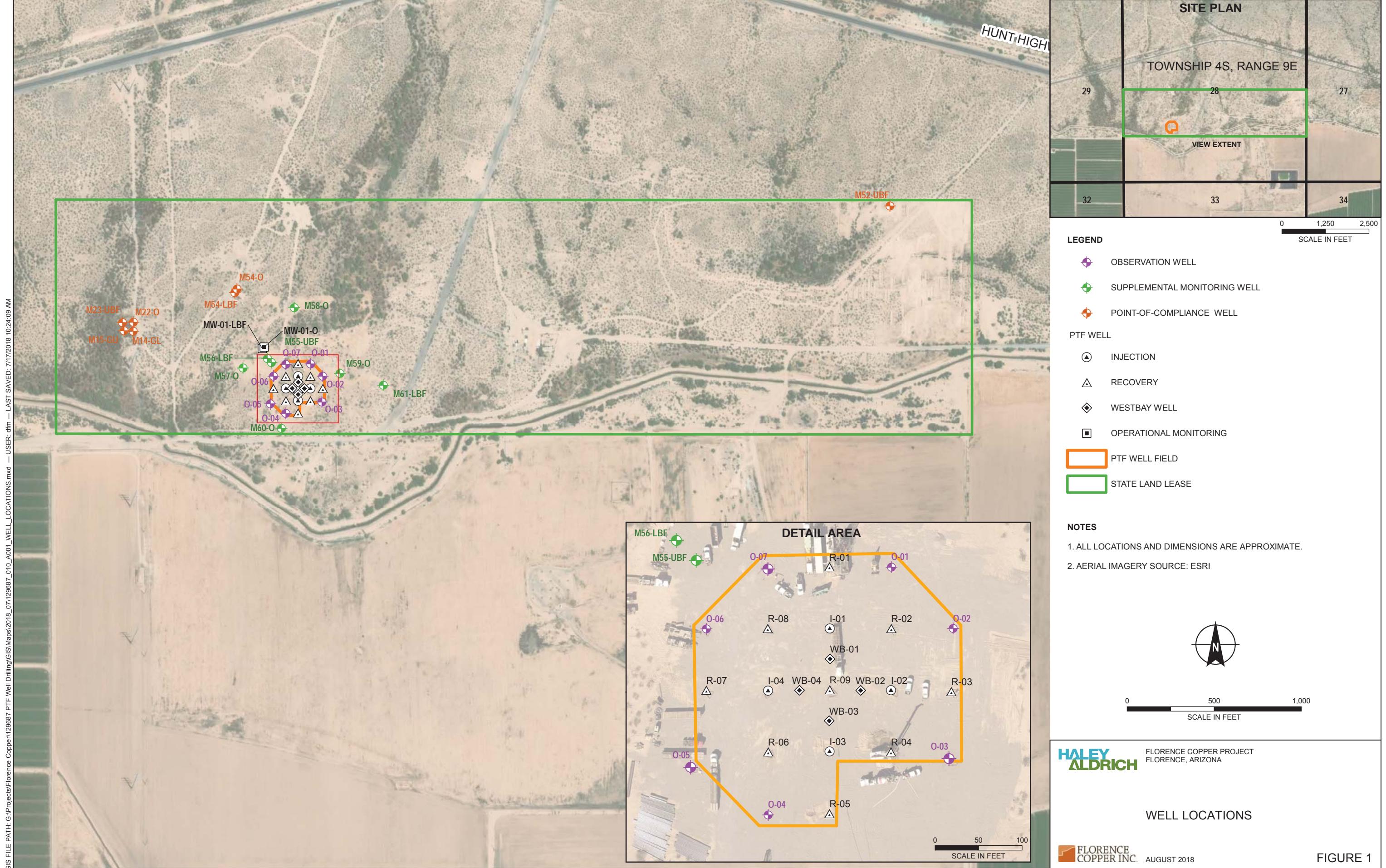
Daniel B. Stephens, Inc., 2014. *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona*. Prepared for Florence Copper. May.

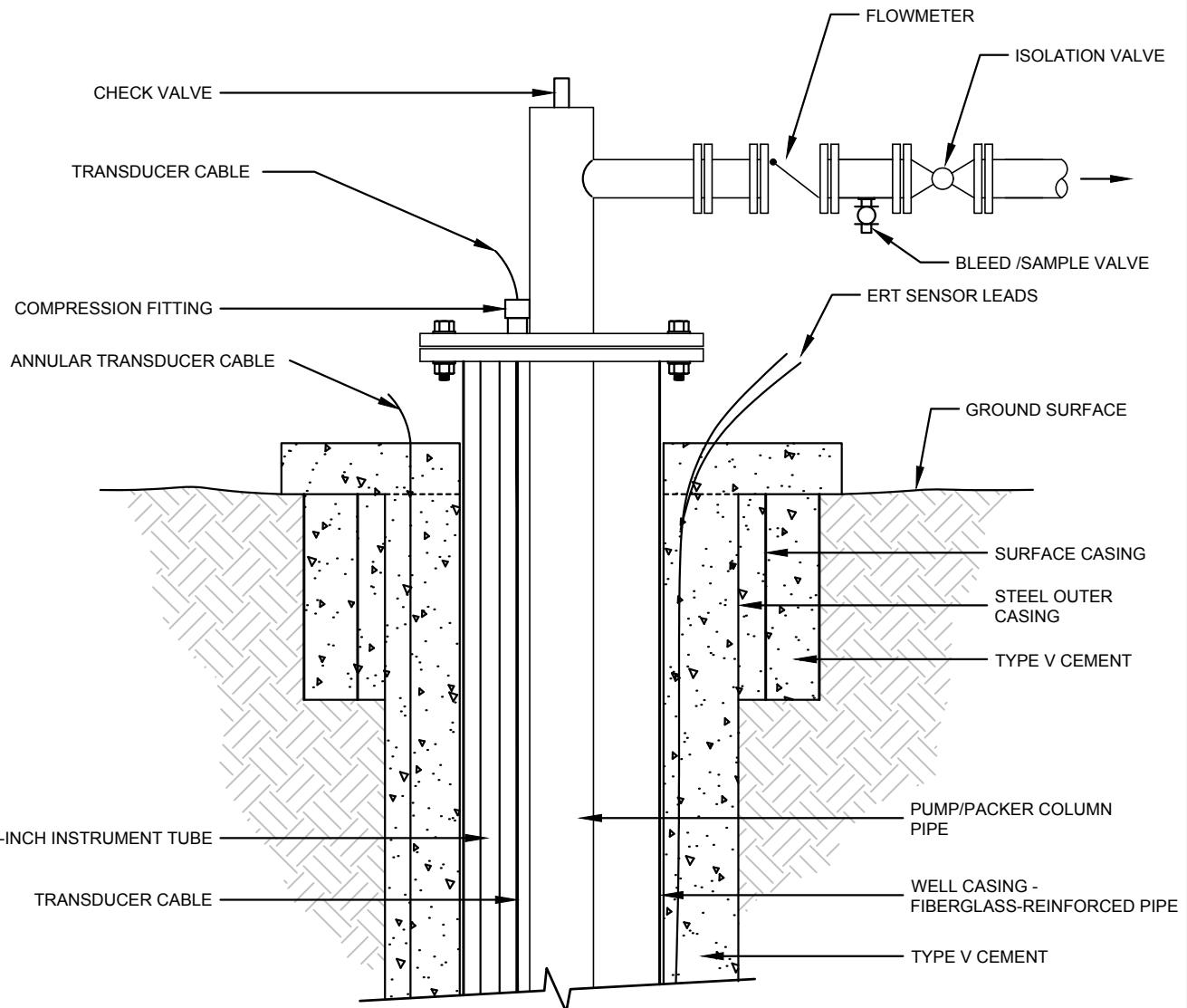
Haley & Aldrich, Inc., 2017. *Well Specification: Drilling, Installation, and Testing of Class III Injection and Recovery Wells, Production Test Facility, Florence, Arizona*. Revised September 2017.

Enclosures:

- Figure 1 – Well Locations
- Figure 2 – Recovery Well Head Detail
- Figure 3 – Geophysical Data and Lithologic Log
- Figure 4 – Well R-09 As-Built Diagram
- Appendix A – Arizona Department of Water Resources Well Registry Report
- Appendix B – Lithologic Log
- Appendix C – Chemical Characteristics of Formation Water
- Appendix D – Well Completion Documentation
- Appendix E –Geophysical Logs
- Appendix F – Cement Bond Log Summary
- Appendix G – SAPT Documentation
- Appendix H – Well Development Field Forms
- Appendix I – Well Video Log and Gyroscopic Survey Reports

FIGURES





NOTES

1. ERT - ELECTRICAL RESISTIVITY TOMOGRAPHY

**HALEY
ALDRICH**

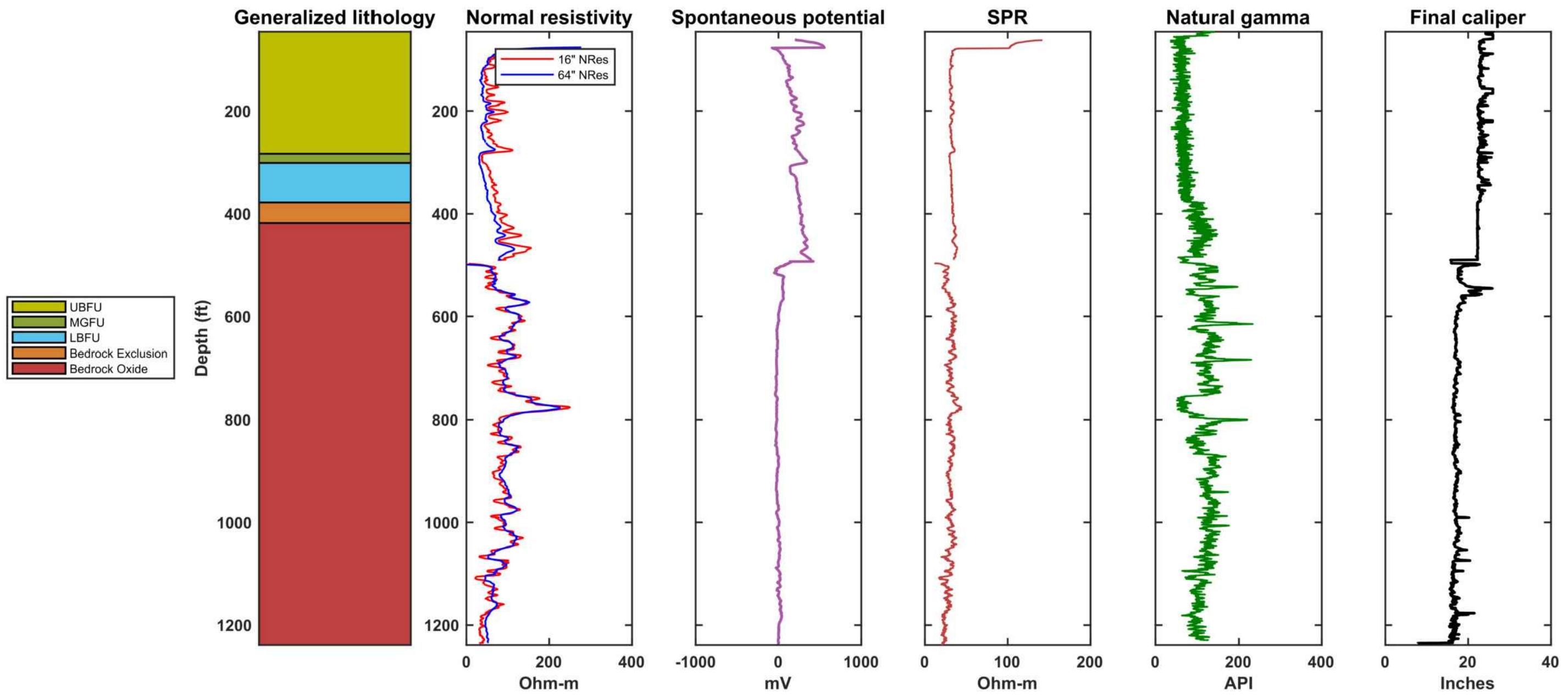
PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

RECOVERY WELL HEAD
DETAIL

 FLORENCE
COPPER INC.

SCALE: NOT TO SCALE
SEPTEMBER 2018

FIGURE 2



**HALEY
ALDRICH**

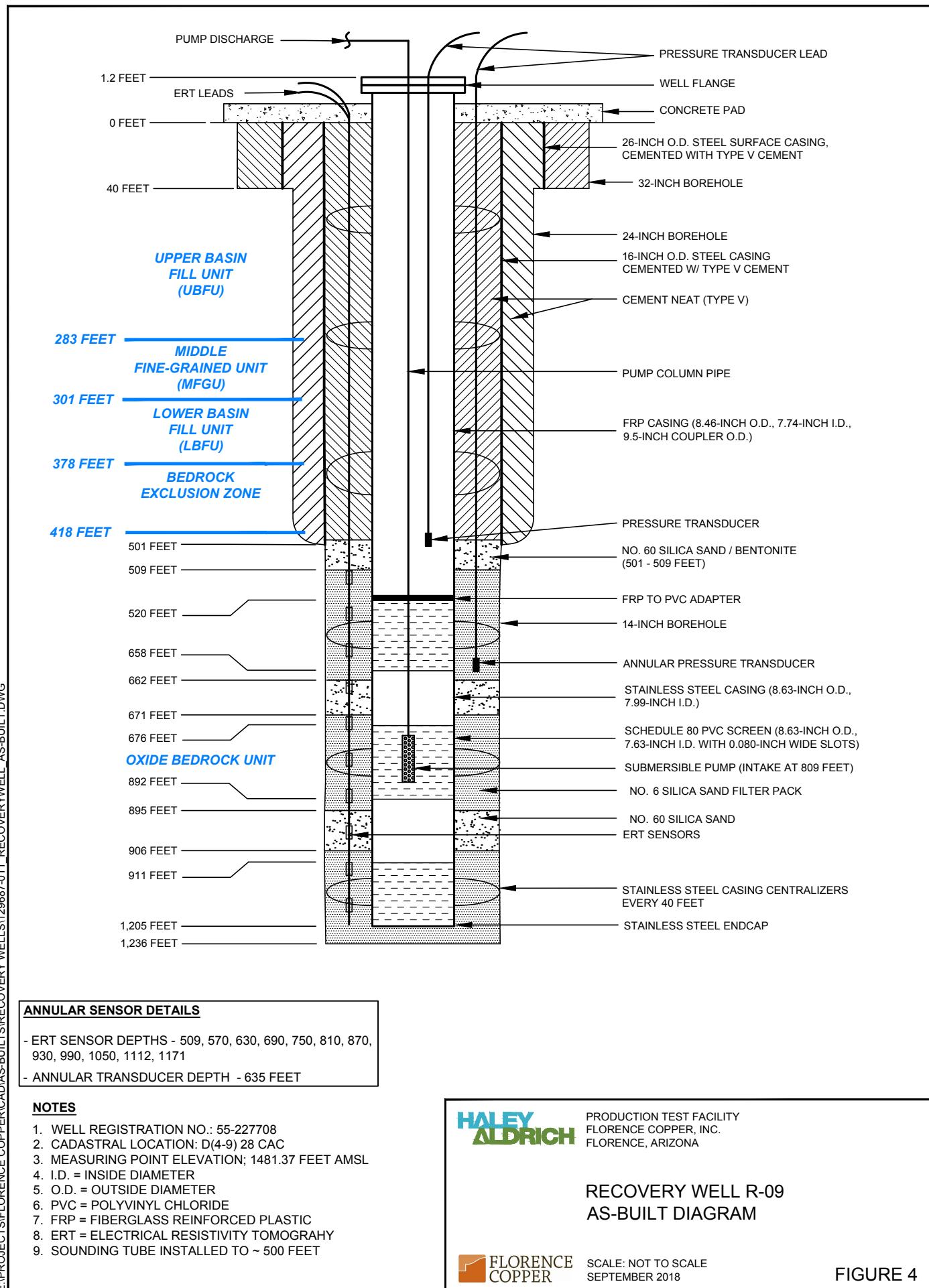
PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

RECOVERY WELL R-09
GEOPHYSICAL DATA AND
LITHOLOGIC LOG



SCALE: AS SHOWN
SEPTEMBER 2018

FIGURE 3



APPENDIX A

Arizona Department of Water Resources Well Registry Report



Arizona Department of Water Resources
 Water Management Division
 P.O. Box 36020 Phoenix, Arizona 85067-6020
 (602) 771-8627 • (602) 771-8690 fax
www.azwater.gov

Well Driller Report

and
Well Log

RECEIVED *CJ*

THIS REPORT MUST BE FILED WITHIN **30 DAYS** OF COMPLETING THE WELL.

PLEASE PRINT CLEARLY USING BLACK OR BLUE INK.

ADWR

FILE NUMBER
D (4-9) 28 CAC

WELL REGISTRATION NUMBER

55 - 227708

PERMIT NUMBER (IF ISSUED)

59-562120.0005

SECTION 1. DRILLING AUTHORIZATION

Drilling Firm

Mail To:	NAME Hydro Resources Inc.	DWR LICENSE NUMBER 816
	ADDRESS 13027 County Rd. 18 Unit C	TELEPHONE NUMBER (303) 857-7544
	CITY / STATE / ZIP Ft. Lupton, CO 80621	FAX (303) 857-2826

SECTION 2. REGISTRY INFORMATION

Well Owner	Location of Well					
FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL Florence Copper Inc.	WELL LOCATION ADDRESS (IF ANY)					
MAILING ADDRESS 1575 W. Hunt Hwy	TOWNSHIP 4S	RANGE 9E	SECTION 28	160 ACRE SW ¼	40 ACRE NE ¼	10 ACRE SW ¼
CITY / STATE / ZIP CODE Florence, AZ 85132	LATITUDE 33 ° 3' 0.71"N	LONGITUDE -111 ° 26' 4.68"W	Minutes Seconds	Degrees Minutes Seconds	Minutes Seconds	Seconds
CONTACT PERSON NAME AND TITLE Ian Ream - Sr. Hydrologist	METHOD OF LATITUDE/LONGITUDE (CHECK ONE) <input checked="" type="checkbox"/> *GPS: Hand-Held <input type="checkbox"/> *GPS: Survey-Grade					
TELEPHONE NUMBER (520) 374-3984	LAND SURFACE ELEVATION AT WELL Feet Above Sea Level					
WELL NAME (e.g., MW-1, PZ-3, Lot 25 Well, Smith Well, etc.) R - 09	METHOD OF ELEVATION (CHECK ONE) <input checked="" type="checkbox"/> *GPS: Hand-Held <input type="checkbox"/> *GPS: Survey-Grade					
	*GEOGRAPHIC COORDINATE DATUM (CHECK ONE) <input checked="" type="checkbox"/> NAD-83 <input type="checkbox"/> Other (please specify):					
	COUNTY PINAL	ASSESSOR'S PARCEL ID NUMBER BOOK MAP PARCEL				

SECTION 3. WELL CONSTRUCTION DETAILS

Drill Method	Method of Well Development	Method of Sealing at Reduction Points
CHECK ALL THAT APPLY <input type="checkbox"/> Air Rotary <input type="checkbox"/> Bored or Augered <input type="checkbox"/> Cable Tool <input type="checkbox"/> Dual Rotary <input checked="" type="checkbox"/> Mud Rotary <input checked="" type="checkbox"/> Reverse Circulation <input type="checkbox"/> Driven <input type="checkbox"/> Jetted <input type="checkbox"/> Air Percussion / Odex Tubing <input type="checkbox"/> Other (please specify):	CHECK ALL THAT APPLY <input checked="" type="checkbox"/> Airlift <input type="checkbox"/> Bail <input type="checkbox"/> Surge Block <input type="checkbox"/> Surge Pump <input type="checkbox"/> Other (please specify):	CHECK ONE <input type="checkbox"/> None <input type="checkbox"/> Packed <input type="checkbox"/> Swedged <input type="checkbox"/> Welded <input type="checkbox"/> Other (please specify):
Condition of Well	Construction Dates	
CHECK ONE <input checked="" type="checkbox"/> Capped <input type="checkbox"/> Pump Installed	DATE WELL CONSTRUCTION STARTED 03/12/2018	
	DATE WELL CONSTRUCTION COMPLETED 05/23/2018	

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.

SIGNATURE OF QUALIFYING PARTY

DATE

5/23/2018

Well Driller Report and Well Log

WELL REGISTRATION NUMBER

55 - 227708

SECTION 4. WELL CONSTRUCTION DESIGN (AS BUILT) (attach additional page if needed)
Depth

DEPTH OF BORING	Feet Below Land Surface	DEPTH OF COMPLETED WELL	Feet Below Land Surface
1236		1205	

Water Level Information

STATIC WATER LEVEL 230 Feet Below Land Surface	DATE MEASURED 04/26/2018	TIME MEASURED 1 PM	IF FLOWING WELL, METHOD OF FLOW REGULATION <input type="checkbox"/> Valve <input type="checkbox"/> Other:
--	-----------------------------	-----------------------	--

Borehole			Installed Casing												
DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)	DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE (T)			PERFORATION TYPE (T)			SLOT SIZE IF ANY (inches)			
FROM (feet)	TO (feet)		FROM (feet)	TO (feet)		STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS KNIFE	SLOTTED	IF OTHER TYPE, DESCRIBE
0	20	32	0	20	26.5	X				X					
20	501	24	0	501	16.5	X				X					
501	1236	14.75	0	521	5.44				FRP	X					
			521	642	5.56	X						X		.080	
			642	662	5.56	X					X				
			662	882	5.56	X						X		.080	
			882	902	5.56	X					X				
			902	1205	5.56	X						X		.080	

Installed Annular Material															
DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE (T)										FILTER PACK			
FROM (feet)	TO (feet)	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	BENTONITE			IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE				SAND	GRAVEL	SIZE
						GROUT	CHIPS	PELLETS							
0	20		X												
0	501		X												
501	509					X									
509	662														
662	671						X								
671	895														
895	906							X							
906	1236														

Well Driller Report and Well Log

WELL REGISTRATION NUMBER

55 - 227708

SECTION 5. GEOLOGIC LOG OF WELL

Well Driller Report and Well Log

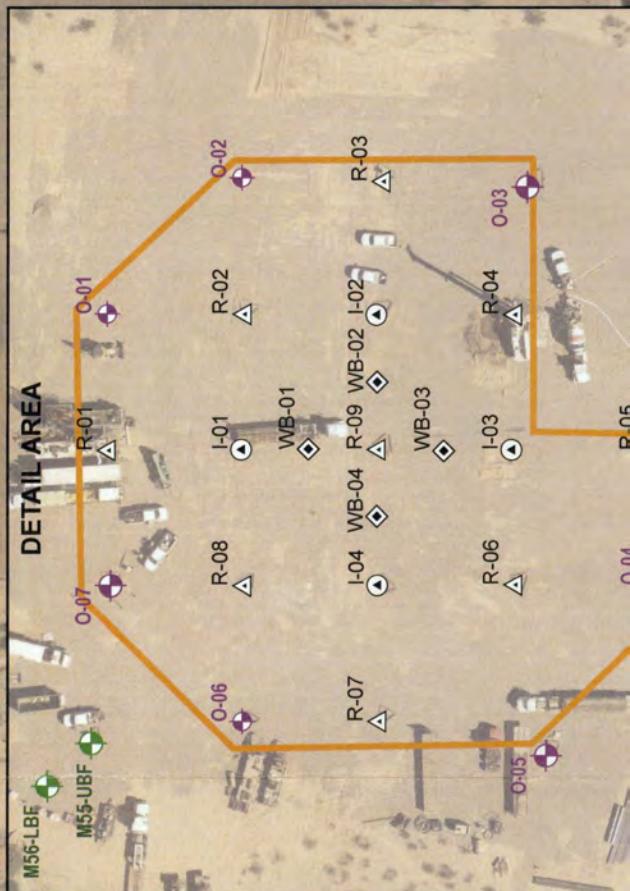
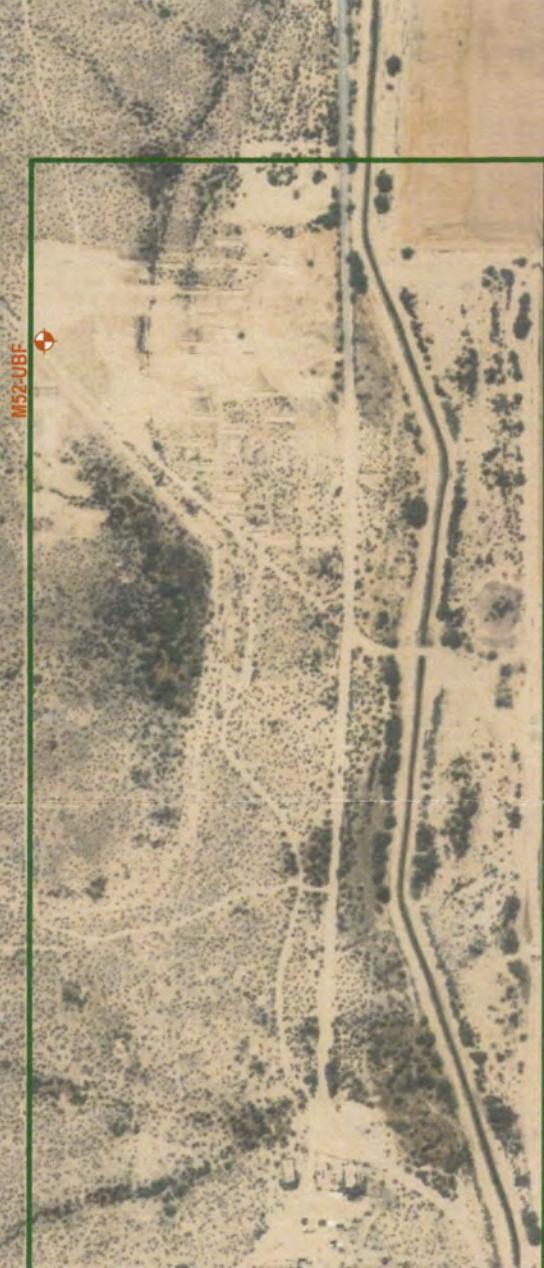
WELL REGISTRATION NUMBER

55 - 227708**SECTION 6. WELL SITE PLAN**

NAME OF WELL OWNER	COUNTY ASSESSOR'S PARCEL ID NUMBER		
	BOOK	MAP	PARCEL
Florence Copper Inc.			

- ❖ Please draw the following: (1) the boundaries of property on which the well was located; (2) the well location; (3) the locations of all septic tank systems and sewer systems on the property or within 100 feet of the well location, even if on neighboring properties; and (4) any permanent structures on the property that may aid in locating the well.
- ❖ Please indicate the distance between the well location and any septic tank system or sewer system.

1" = _____ ft



Run Date: 09/07/2017

AZ DEPARTMENT OF WATER RESOURCES

WELL REGISTRY REPORT - WELLS55

Location D 4.0 9.0 28 C A C Well Reg.No
55 - 227708 AMA PINAL AMA

Registered Name FLORENCE COPPER INC File Type NEW WELLS (INTENTS OR APPLICATIONS)
1575 W HUNT HWY Application/Issue Date 08/21/2017

FLORENCE AZ 85132

Owner	OWNER	Well Type	NON-EXEMPT
Driller No.	816	SubBasin	ELOY
Driller Name	HYDRO RESOURCES - ROCKY MOUNTAIN, INC.	Watershed	UPPER GILA RIVER
Driller Phone	303-857-7540	Registered Water Uses	INDUSTRIAL
County	PINAL	Registered Well Uses	WATER PRODUCTION
Intended Capacity GPM	0.00	Discharge Method	NO DISCHARGE METHOD LISTED
		Power	NO POWER CODE LISTED

Well Depth	0.00	Case Diam	0.00	Tested Cap	0.00
Pump Cap.	0.00	Case Depth	0.00	CRT	
Draw Down	0.00	Water Level	0.00	Log	
		Acres Irrig	0.00	Finish	NO CASING CODE LISTED

Contamination Site: NO - NOT IN ANY REMEDIAL ACTION SITE

Tribe: Not in a tribal zone

Comments R-09



55-227708

Current Action

9/1/2017 555 DRILLER & OWNER PACKETS MAILED

Action Comment: sm

Action History

9/1/2017 867 APP/NOI HYDRO/WATER QUALITY REVIEW COMPLETE

Action Comment: pw

9/1/2017 550 DRILLING AUTHORITY ISSUED

Action Comment: sm

8/28/2017 866 APP/NOI SENT TO HYDRO/WATER QUALITY REVIEW

Action Comment: sm

8/21/2017 150 NOI RECEIVED FOR A NEW PRODUCTION WELL

Action Comment: sm

**ARIZONA DEPARTMENT OF WATER RESOURCES
GROUNDWATER PERMITTING AND WELLS UNIT
1110 Washington St., Suite 310, Phoenix, AZ 85007-2952**

THIS AUTHORIZATION SHALL BE IN THE POSSESSION OF THE DRILLER DURING ALL DRILL OPERATIONS

WELL R-09

WELL REGISTRATION NO: 55-227708

AUTHORIZED DRILLER: HYDRO RESOURCES

LICENSE NO: 816

A NOTICE OF INTENTION TO DRILL A NON-EXEMPT WELL INSIDE THE PHOENIX ACTIVE MANAGEMENT AREA HAS BEEN GRANTED TO:

WELL OWNER: FLORENCE COOPER, INC. 1575 W HUNT HWY FLORENCE, AZ 85132

The well(s) is/are to be located in the:

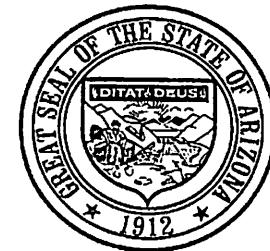
SW $\frac{1}{4}$ of the NE $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 28, Township 4 South, Range 9 East

No. of well(s) in this project: 1

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE 22TH DAY OF AUGUST, 2018.

Shelley Morris
GROUNDWATER PERMITTING AND WELLS UNIT

**THE DRILLER MUST FILE A LOG OF THE WELL
WITHIN 30 DAYS OF COMPLETION OF DRILLING**





DOUGLAS A. DUCEY
Governor

THOMAS BUSCHATZKE
Director

ARIZONA DEPARTMENT of WATER RESOURCES
1110 W. Washington St., Suite 310
Phoenix, Arizona 85007-2952
602.771.8500
azwater.gov

September 1, 2017

Ian Ream
Florence Copper, Inc.
1575 W. Hunt Hwy
Florence, AZ 85132

RE: Notice of Intention to Modify an Existing Non-Exempt Well
Well Registration No. 55-227700 thru 55-227708
File No. D (4-9) 28 CCA & CCD

Dear Mr. Ream:

The Notice of Intention to Modify an Existing Non-Exempt Well inside the Pinal Active Management Area has been approved. A copy of the Notice is enclosed for your records. The drilling card for the modification of the above referenced well has been forwarded to your well driller.

Within 30 days of completion of the well, the well driller is required to furnish this Department with a complete and accurate log of the well. In addition, the well owner is required to submit the enclosed Completion Report within 30 days of installation of pump equipment.

Pursuant to the provisions of A.R.S. § 45-604, any person withdrawing groundwater from a well is required to use a water measuring device to record rates of withdrawal in order to provide or allow the computation of an annual volume of pumpage from the well. The total volume of pumpage shall be reported on an annual report. The annual report shall be submitted no later than March 31 following the end of each completed annual reporting period. The first annual report period shall be from the date of this permit through December 31, 2017.

The Department has issued the authorization to modify this well pursuant to A.R.S. §§ 45-596 and 45-597 of the Groundwater Code. The legal nature of the water withdrawn from the well may be the

Florence Cooper Inc.
September 1, 2017
Re: Notice of Intention to Drill a Non-Exempt Well
Page 2

subject of court action in the future as part of a determination of surface water rights in your area. If there are court proceedings that could affect your well, you will be notified and be given the opportunity to participate.

Under A.R.S. § 45-593, the person to whom a well is registered must notify the Department of a change in ownership, physical characteristics or any other data about the well in order to keep the well registration records current and accurate. Forms may be obtained by contacting the Department, or online at <http://www.azwater.gov>

If you have any questions about the terms and conditions of the permit or require any administrative corrections to this permit, please contact the Groundwater Permitting Wells Unit at (602) 771-8527.

Sincerely,



Stella Murillo, Manager
Groundwater Permitting and Wells Section

Enclosures

R-09

**ARIZONA DEPARTMENT OF WATER RESOURCES
GROUNDWATER PERMITTING AND WELLS UNIT
MAIL TO: P.O. BOX 36020, PHOENIX, ARIZONA 85067-6020
1110 W. Washington St. Suite 310, Phoenix, Arizona 85007-2952
Phone (602) 771-8527 Fax (602) 771-8590**

RECEIVED

AUG 21 2017

ARIZONA DEPARTMENT
OF WATER RESOURCES

**NOTICE OF INTENTION TO DRILL A NON-EXEMPT WELL PURSUANT TO A GROUNDWATER
WITHDRAWAL PERMIT (OTHER THAN A GENERAL INDUSTRIAL USE PERMIT)
IN AN ACTIVE MANAGEMENT AREA**

PLEASE READ GENERAL INSTRUCTIONS AND CONDITIONS ON REVERSE SIDE OF THIS FORM BEFORE COMPLETING.

Section § 45-598, Arizona Revised Statutes provides: In an Active Management Area, prior to drilling a well, a person entitled to withdraw groundwater shall file a Notice of Intention to Drill with the Department. Pursuant to A.R.S. § 45-596 and A.A.C. R12-15-104, the filing fee for this application is \$150.00.

1. WELL/LAND LOCATION:

4S	N/S	9E	E/W	28
Township	Range	NE	SW	Section
SW 1/4	1/4	NE 1/4	SW 1/4	
10 Acre	40 Acre	160 Acre		

2. POSITION LOCATION OF THE WELL:

Latitude 33 ° 3' 0.69" N
Longitude 111 ° 26' 4.70" W

3. COUNTY Pinal

4. APPLICANT

Florence Copper, Inc.
Name 1575 W Hunt Hwy
Mailing Address Florence AZ 85132
City Florence State AZ Zip 85132
Telephone No. 520-374-3984

5. OWNER OF THE LAND OF WELLSITE:

AZ State Land (Mineral Lease #11-026500)
Name 1616 W Adams Street
Mailing Address Phoenix AZ 85007
City Phoenix State AZ Zip 85007
Telephone No. 602-542-4631

6. THIS NOTICE IS FILED BY:

Check one: Owner Lessee

Name Ian Ream
Mailing Address 1575 W Hunt Hwy
City Florence State AZ Zip 85132

7. DESCRIPTION OF THE PROPOSED WELL:

Diameter 5 Inches
Depth 1200 Feet
Type of Casing Steel/FRP/PVC

8. ESTIMATE OF TOTAL ANNUAL PUMPAGE:

97 Acre-feet per Year

9. PRINCIPAL USE OF WATER (be specific):

Mineral Extraction

10. OTHER USES INTENDED (be specific):

None

11. CONSTRUCTION WILL START:

September 2017
Month Year

12. CLAIM OF ENTITLEMENT TO WITHDRAW GROUNDWATER:

Permit 59- 562120.0005

13. DRILLING FIRM:

Name HydroResources

Mailing Address 13027 County Rd 18, Unit C

City Fort Lupton State CO Zip 80621

Telephone No. 303-857-7540

DWR License Number 816

ROC License Category A-4

14. Is the proposed well within 100 feet of a septic tank system, sewage area, landfill, hazardous waste facility or storage area of hazardous material or a petroleum storage area and tank? Yes No

FOR DEPARTMENT USE ONLY

File No. D(4-9)28CAC
Filed 8-21-17 By Sm
Input .. By ..

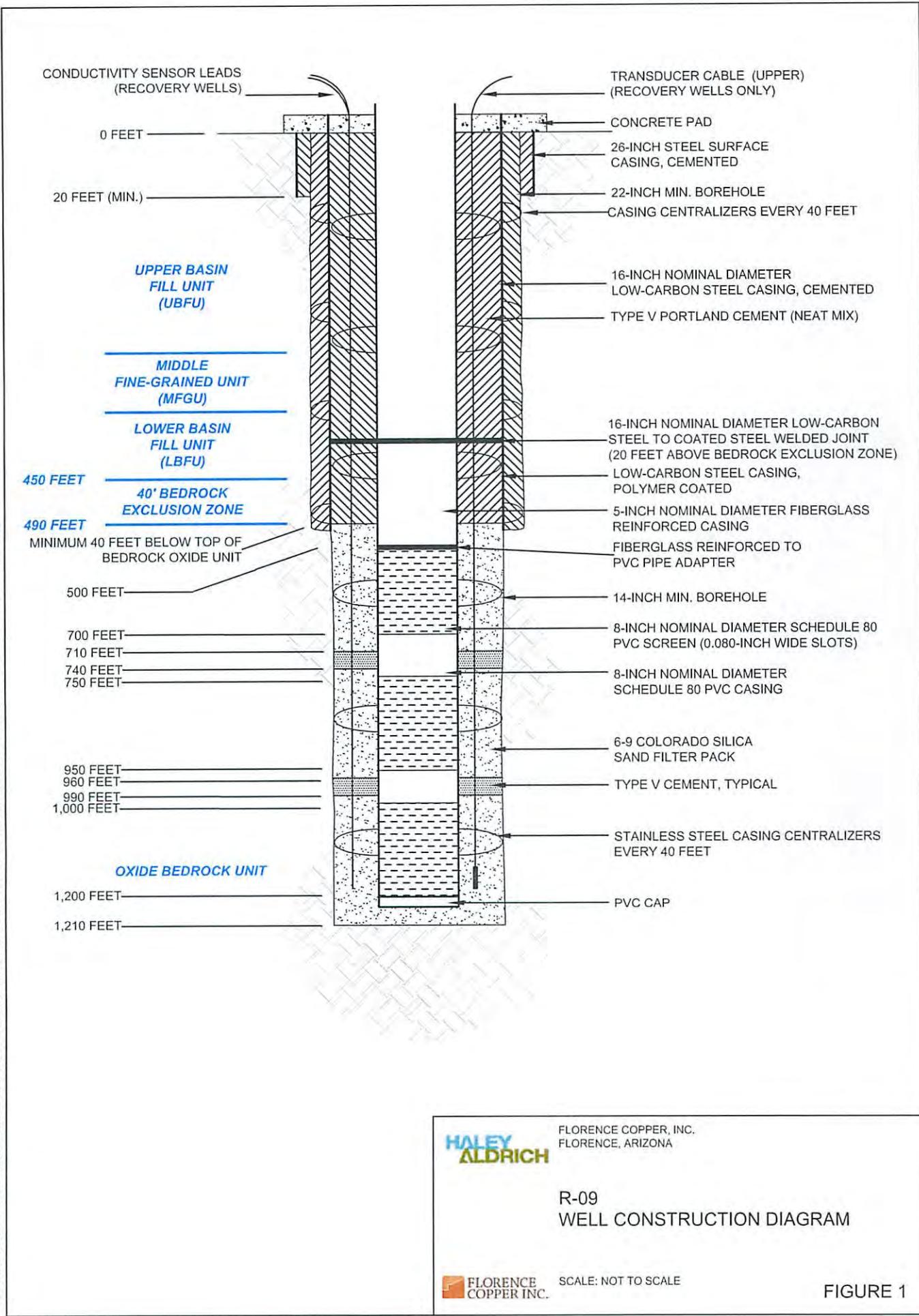
DUPLICATE

Mailed .. By Sm
Registration 55-227709
AMA/INA XNL

- 15. Attach a detailed construction diagram of the proposed well design. The diagram should provide verification of consistency with minimum construction requirements. Specifically, the diagram should include an indication of the perforated interval location(s) in relationship to the expected water level; the depth and thickness of the surface seal, and grouting material used; whether the surface or conductor casing will extend above grade; and vault details, if specified.**

I state that this Notice is filed in compliance with Rules A.A.C. R12-15-809 and R12-15-816(F), and is complete and correct to the best of my knowledge and belief, and that I understand the conditions set forth on the reverse side of this form.

Ian Ream BR Senior Hydrogeologist 8-17-2017
Type or Print Name and Signature Land Owner Lessee of well site Title Date



HALEY
ALDRICH

FLORENCE COPPER, INC.
FLORENCE, ARIZONA

R-09
WELL CONSTRUCTION DIAGRAM

ARIZONA DEPARTMENT OF WATER RESOURCES

GROUNDWATER PERMITTING AND WELLS UNIT

1110 W. Washington St. Suite 310, Phoenix, Arizona 85007-2952

Phone (602) 771-8585 Fax (602) 771-8688

WELL CONSTRUCTION SUPPLEMENT (form DWR 55-90)

Well Registration Number 55-227708

1. Well Location:

SW $\frac{1}{4}$ of the NE $\frac{1}{4}$ of the SW $\frac{1}{4}$, Sec. 28, Township 4S Range 9E.
10AC 40AC 160AC

2. Position Location of the Well:

Latitude 33°3' 0.69" Longitude 111°26' 4.70"

Datum: NAD 83 NAD 27 Other: _____

3. County: PINAL

4. Date construction to start: SEPTEMBER 2017

5. Time period well will remain in use: 5 YEARS

6. Is pump equipment to be installed? YES If so, design pump capacity: 60 GPM.

7. Well construction plan:

a. Drilling method (mud rotary, hollow-stem auger, etc.) MUD ROTARY

b. Borehole diameters 32 inches from 0 feet to 20 feet.
22 inches from 20 feet to 490 feet.
14 inches from 490 feet to 1210 feet.

c. Casing materials STEEL/FIBERGLASS REINFORCED PLASTIC/PVC

d. Method of well development (bail, air lift, surge, etc.) AIRLIFT, SURGE

e. Will surface or conductor casing extend above grade? NO

8. Include a detailed construction diagram of the proposed well design. The diagram should verify consistency with minimum construction requirements specified in the Department's well construction rules found in Arizona Administrative Code (A.A.C.) R12-15-801 et seq. Specifically, the diagram should include borehole diameters; casing materials and diameters; perforation intervals; the expected water level; depth and thickness of the surface seal; proposed grouting materials; and the length that the surface or conductor casing will extend above grade, or vault details, if specified.

Pursuant to Arizona Revised Statutes (A.R.S.) § 45-594.B, all well construction, replacement, deepening and abandonment operations shall comply with the rules adopted pursuant to this section. Therefore, any existing well that is deepened or modified must be brought into compliance with minimum well construction standards specified above, if not already in compliance.

9. Proposed materials and method of abandonment if well is to be abandoned after project is completed (Minimum requirements per A.A.C. R12-15-816):

10. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility, storage area of hazardous material, or petroleum storage area or tank? Yes No

11. Is this well to monitor existing contamination? Yes No

Potential contamination? Yes No If yes, please provide explanation:

12. Name of Consulting firm, if any: HALEY & ALDRICH

400 E VAN BUREN STREET SUITE 545	PHOENIX	AZ	85004
Address	City	State	Zip

Contact Person: LAUREN CANDREVA Telephone Number: 602- 760-2429

13. Drilling firm HYDRORESOURCES

DWR License Number: 816 ROC License Category: A-4

14. Special construction standards, if any, required pursuant to A.A.C. R12-15-821: _____

I (we), Ian Regan (print name) hereby affirm that all information provided in this application is true and correct to the best of my/our knowledge and belief.

Signature of Applicant  Date 8-17-2017



Memorandum

To: Stella Murillo, Groundwater Permitting and Wells
From: Phil Whitmore, Groundwater Permitting and Wells *PHW*
CC: Jeff Tannler, Statewide AMA Director
Date: 8/29/2017
Subject: Review of Application for a Permit to Drill or Operate Nine Non-exempt Wells within an Active Management Area
59-562120 55-227700-08 D(4-9)CAC & CBD
Florence Copper, Inc.

ADWR has reviewed the above-referenced applications for nine (9) permits to drill and operate a non-exempt well in the Pinal AMA. This hydrologist review is limited to conformance with well construction standards only.

The applicant proposes to withdraw 48.5 acre-feet per year from 8 of the new wells and 97 acre-feet per year from one well pursuant to the applicant's Mineral Extraction Withdrawal permit (59-562120.0005).

Well Construction

The applicant proposes that all nine (9) wells will be drilled and constructed in the same manner and drill depths. Each well will be 1210 feet deep with three (3) 200-foot screen intervals all open in the bedrock aquifer only. Eight of wells will have 5-inch and one will have 8-inch diameter inner casing constructed with PVC and include elements to reduce chemical corrosion.

The applications each included proposed well construction diagrams indicating that the outer annulus of the wells will be sealed from the surface to 20 feet below land surface and an inner annulus will be sealed to 490 below land surface. The estimated contact of the lower basin fill unit and the crystalline bedrock is approximately 490 feet deep.

The well diagrams did not indicate the height of well stick up and the applicant did not include a request for variance. However, if stick up is to be less than 1 foot above land surface a request for variance should be submitted to comply with Arizona Administrative Code R12-15-820.

Conclusion

We recommend issuing a permit to drill and operate all nine (9) non-exempt wells in the proposed location, at the volume and well construction specifications stated in the application.

Arizona Department of Water Resources

1110 West Washington Street, Suite 310

Phoenix AZ 85007

Customer:

LINDA DOMBROWSKI
70 BLANCHARD ROAD
BURLINGTON, MA 01803

Receipt #: 18-53416
Office: MAIN OFFICE
Receipt Date: 08/21/2017
Sale Type: IN_PERSON
Cashier: WRSAM

Item No.	Function Code	AOBJ	Description	Ref ID	Qty	Unit Price	Ext Price
67491	122221	4439-TT	Permit to drill non-exempt well in an active management area	227708	1	150.00	150.00
RECEIPT TOTAL:							150.00

Payment type: CREDIT CARD

Amount Paid: \$150.00

Authorization 189991565

Payment Received Date: 08/21/2017

Notes: FROM TTA.

APPENDIX B
Lithologic Log

LITHOLOGIC LOG							R-09		
Project Production Test Facility, Florence, Arizona Client Florence Copper, Inc. Contractor Cascade Drilling LLC							File No. 129687 Sheet No. 1 of 15 Cadastral Location D (4-9) 28 CAC		
Drilling Method Reverse Rotary			Land Surface Elevation 1478.38 feet, amsl				Start 1 March 2018		
Borehole Diameter(s) 30/20/14.75 in.			Datum State Plane NAD 83				Finish 12 March 2018		
Rig Make & Model Challenger 280			Location N 746,132 E 847,695				H&A Rep. S. Kaney		
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION			COMMENTS		
0		SM		SILTY SAND with GRAVEL (0-8 feet) Primarily fine sand with ~20% fines and ~15% gravel up to 30mm. Sand is subangular to subrounded and gravel is subangular to rounded. Fines are nonplastic, no toughness, and low dry strength (7.5YR 4/4). UBFU			<p>Well Registry ID: 55-227708 Surface Completion: Bolted Sealed Well Flange Well casing stickup: 1.93 feet als COLOR IDENTIFICATION MADE WITH WET SAMPLES USING MUNSELL CHART</p> <p>Surface Casing: 24-inch mild steel; 0 - 40 feet Overburden Casing: 14-inch mild steel; 0 - 501 feet Well Casing: Nominal 5-inch diameter Fiberglass Reinforced; -1.93 - 520 feet</p> <p>Unit Intervals: UBFU: 0 - 283 feet MGFU: 283 - 301 feet LBFU: 301 - 378 feet Oxide Bedrock: 378 - 1244 feet</p>		
-1475		SW-SM	8	WELL GRAND SAND with SILT (8-24 feet) Primarily fine to coarse sand with ~15% fines and ~10% gravel up to 170mm. Sand is subangular to subrounded and gravel is subangular to rounded. Fines are nonplastic, no toughness, and low dry strength (7.5YR 4/4). UBFU					
-1470		SW-SM	24	WELL GRADED SAND with SILT and GRAVEL (24-37 feet) Primarily fine to coarse sand with ~5% fines and ~20% gravel up to 160mm. Sand is subangular to subrounded and gravel is subangular to rounded. Fines are nonplastic, no toughness, and no dry strength (7.5YR 3/4). UBFU					
-1465		SW-SM	37	CLAYEY SAND with GRAVEL (37-40 feet) Primarily fine sand with ~15% fines and ~15% gravel up to 60mm. Sand is subangular to subrounded and gravel is subangular to rounded. Fines have medium plasticity, medium toughness, and high dry strength (7.5YR 4/3). UBFU					
-1455		SC	40	POORLY GRADED GRAVEL with SAND (40-65 feet) primarily gravel up to 35mm with ~30% sands and ~5% fines. Sand is subrounded to subangular and gravel is rounded to subrounded. Fines are nonplastic, no toughness, no dry strength, are reddish brown (5YR 4/4), and strong reaction to HCL. UBFU					
-1445		GP		WELL GRADED SAND with GRAVEL and SILT (65-90 feet) Primarily coarse to fine sand with ~10% fines and ~25% gravel up to 15mm. Sand and gravel is subrounded to subangular. Fines are nonplastic, no toughness, no dry strength, are yellowish red (5YR 4/6), and moderate reaction to HCL. UBFU					
-1435									
-1425									
-1415									
-1405									
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).							R-09		

LITHOLOGIC LOG							R-09 File No. 129687 Sheet No. 2 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION			
-75							
-1400							
80							
-1395							
85							
-1390							
90							
-1385	SP-SM			POORLY GRADED SAND with SILT (90-140 feet) Primarily medium sand with ~15% fines and ~5% gravel up to 20mm. Sand and gravel is subrounded. Fines have low plasticity, low toughness, low dry strength, are reddish brown (5YR 4/3), and moderate reaction to HCL. UBFU			
95							
-1380							
100							
-1375							
105							
-1370							
110							
-1365							
115							
-1360							
120							
-1355							
125							
-1350							
130							
-1345							
135							
-1340	SP			POORLY GRANULAR SAND with GRAVEL (140-160 feet) Primarily coarse to medium sand with ~5% fines and ~20% gravel up to 25mm. Sand is subrounded and gravel is subangular. Fines are nonplastic, no toughness, no dry strength, are reddish brown (5YR 5/4), and strong reaction to HCL. UBFU			
140							
-1335							
145							
-1330							
150							
-1325							
155							
-1320							
160	ML			SANDY SILT (160-180 feet) Primarily fines with ~40% sands and trace gravel. Sand is			
-160							
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).							R-09

LITHOLOGIC LOG					R-09 File No. 129687 Sheet No. 3 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
-1315				rounded. Fines have low plasticity, low toughness, low dry strength, are reddish brown (5YR 5/3), and strong reaction to HCL. UBFU	
-165					
-1310					
-170					
-1305					
-175					
-1300					
-180	GW		180	WELL GRADED GRAVEL with SAND (180-235 feet) Primarily gravel up to 60mm with ~50% sands and trace fines. Sand and gravel is rounded to subrounded. Fines are nonplastic, no toughness, no dry strength, are brown (10YR 5/3), and strong reaction to HCL. UBFU	
-1295					
-185					
-1290					
-190					
-1285					
-195					
-1280					
-200					
-1275					
-205					
-1270					
-210					
-1265					
-215					
-1260					
-220					
-1255					
-225					
-1250					
-230					
-1245					
-235	SW-SM		235	WELL GRADED SAND with GRAVEL and SILT (235-265 feet) Primarily medium to coarse sand with ~10% fines and ~15% gravel up to 30mm. Sand and gravel is subrounded to subangular. Fines have medium plasticity, low toughness, low dry strength, are brown (10YR 4/3), and strong reaction to HCL. UBFU	
-1240					
-240					
-1235					
-245					
-1230					

HALEY ALDRICH							LITHOLOGIC LOG			
							File No. 129687 Sheet No. 4 of 15			
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION						
-250										
-1225										
-255										
-1220										
-260										
-1215										
-265	GP	265		POORLY GRADED GRAVEL with SAND (265-283 feet) Primarily gravel up to 50 mm with ~45% sands and ~5% fines. Sand is subrounded to subangular and gravel is subrounded. Fines are nonplastic, no toughness, no dry strength, are reddish brown (5YR 4/4), and moderate reaction to HCL. MGFU						
-1210										
-270										
-1205										
-275										
-1200										
-280										
-1195	CH	283		FAT CLAY (283-301 feet) Primarily fines with ~15% sands. Sand is mostly rounded. Fines have high plasticity, medium toughness, low dry strength, are reddish brown (5YR 4/4), and weak reaction HCL. LBFU						
-285										
-1190										
-290										
-1185										
-295										
-1180										
-300	SW	301		WELL GRADED SAND with GRAVEL (301-378) Primarily coarse to fine sand with ~5% fines and ~20% gravel up to 55mm. Sand is subangular to angular and gravel is subrounded to subangular. Fines have low plasticity, low toughness, no dry strength, are reddish brown (5YR 5/3), and strong reaction to HCL. LBFU						
-1175										
-305										
-1170										
-310										
-1165										
-315										
-1160										
-320										
-1155										
-325										
-1150										
-330										
-1145										
335										

LITHOLOGIC LOG					R-09 File No. 129687 Sheet No. 5 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
	SW			<p>WELL GRADED SAND with GRAVEL (301-378) Continued</p> <p>-1140</p> <p>-340</p> <p>-1135</p> <p>-345</p> <p>-1130</p> <p>-350</p> <p>-1125</p> <p>-355</p> <p>-1120</p> <p>-360</p> <p>-1115</p> <p>-365</p> <p>-1110</p> <p>-370</p> <p>-1105</p> <p>-375</p> <p>-1100</p> <p>378</p> <p>-380</p> <p>QUARTZ MONZONITE (378-515 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.</p> <p>-385</p> <p>-1095</p> <p>-390</p> <p>-1090</p> <p>-395</p> <p>-1085</p> <p>-400</p> <p>-1080</p> <p>-405</p> <p>-1075</p> <p>-410</p> <p>-1070</p> <p>-415</p> <p>-1065</p> <p>-420</p> <p>422</p>	

HALEY ALDRICH LITHOLOGIC LOG					R-09 File No. 129687 Sheet No. 6 of 15
Depth (ft)	Elevation	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION		
		Stratum Change Depth (ft)			
-1055			QUARTZ MONZONITE (378-515 feet) Continued		
-425					
-1050					
-430					
-1045					
-435					
-1040					
-440					
-1035					
-445					
-1030					
-450					
-1025					
-455					
-1020					
-460					
-1015					
-465					
-1010					
-470					
-1005					
-475					
-1000					
-480					
-995					
-485					
-990					
-490					
-985					
-495					
-980					
-500					
-975					
-505					
-970					

LITHOLOGIC LOG					R-09 File No. 129687 Sheet No. 7 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
-510					
-965					
-515	515			GRANODIORITE (515-525 feet) Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.	Filter Pack: No. 60 Silica Sand 509 -662, 671 - 895, 906 - 1236 feet Fine Sand Intervals: 662 - 671, 895 - 906 feet Thread Adapter: Stainless Steel, SCH 80 F480 PVC to API; 520 feet
-960					
-520					
-955					
-525	525			QUARTZ MONZONITE (525-590 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.	Well Screen: Nominal 5-inch diameter, SCH 80 PVC Screen (0.080-inch slots); 520 - 658, 676 - 892, 911 - 1205 feet ERT Sensor Depths: 509, 570, 630, 690, 750, 810, 870, 930, 990, 1050, 1112, 1171 feet
-950					
-530					
-945					
-535					
-940					
-540					
-935					
-545					
-930					
-550					
-925					
-555					
-920					
-560					
-915					
-565					
-910					
-570					
-905					
-575					
-900					
-580					
-895					
-585					
-890					
-590	590			GRANODIORITE (590-615 feet) Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.	
-885					
-595					

LITHOLOGIC LOG					R-09 File No. 129687 Sheet No. 8 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
				<p>GRANODIORITE (590-615 feet) Continued</p> <p>QUARTZ MONZONITE (615-725 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.</p>	

LITHOLOGIC LOG					R-09 File No. 129687 Sheet No. 9 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
-795				QUARTZ MONZONITE (615-725 feet) Continued	
-685					
-790					
-690					
-785					
-695					
-780					
-700					
-775					
-705					
-770					
-710					
-765					
-715					
-760					
-720					
-755					
-725	725			GRANODIORITE (725-730 feet) Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.	
-750	730			QUARTZ MONZONITE (730-750 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.	
-735					
-740					
-745					
-730					
-750	750			GRANODIORITE (750-760 feet) Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.	
-725					
-755					
-720					
-760	760			QUARTZ MONZONITE (760-780 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.	
-715					
-765					
-710	710		769		

LITHOLOGIC LOG					R-09 File No. 129687 Sheet No. 10 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
-770				QUARTZ MONZONITE (760-780 feet) Continued	
-705					
-775					
-700					
-780			780	DIABASE (780-795 feet) Dark gray to black igneous rock.	
-695					
-785					
-690					
-790					
-685					
-795			795	QUARTZ MONZONITE (795-830 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.	
-680					
-800					
-675					
-805					
-670					
-810					
-665					
-815					
-660					
-820					
-655					
-825					
-650					
-830			830	GRANODIORITE (830-840 feet) Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.	
-645					
-835					
-640					
-840			840	QUARTZ MONZONITE (840-1200 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.	
-635					
-845					
-630					
-850					
-625					
-855			856		

HALEY
ALDRICH

LITHOLOGIC LOG

R-09File No. 129687
Sheet No. 11 of 15

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
-620				QUARTZ MONZONITE (840-1200 feet) Continued
-860				
-615				
-865				
-610				
-870				
-605				
-875				
-600				
-880				
-595				
-885				
-590				
-890				
-585				
-895				
-580				
-900				
-575				
-905				
-570				
-910				
-565				
-915				
-560				
-920				
-555				
-925				
-550				
-930				
-545				
-935				
-540				
-940				
				943

HALEY ALDRICH					LITHOLOGIC LOG	R-09 File No. 129687 Sheet No. 12 of 15	
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)				
-535			VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION				
-945			QUARTZ MONZONITE (840-1200 feet) Continued				
-530							
-950							
-525							
-955							
-520							
-960							
-515							
-965							
-510							
-970							
-505							
-975							
-500							
-980							
-495							
-985							
-490							
-990							
-485							
-995							
-480							
-1000							
-475							
-1005							
-470							
-1010							
-465							
-1015							
-460							
-1020							
-455							
-1025							
-450							

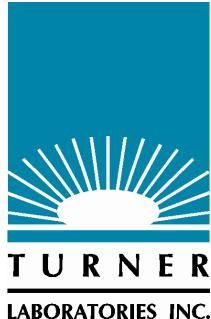
HALEY ALDRICH					LITHOLOGIC LOG	R-09 File No. 129687 Sheet No. 13 of 15	
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)				
VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION							
-1030	1030		QUARTZ MONZONITE (840-1200 feet) Continued				
-445							
-435							
-425							
-415							
-405							
-395							
-385							
-375							
-365							
-355							
-345							
-335							
-325							
-315							
-305							
-295							
-285							
-275							
-265							
-255							
-245							
-235							
-225							
-215							
-205							
-195							
-185							
-175							
-165							
-155							
-145							
-135							
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-105							
-95							
-85							
-75							
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795							
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955							
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985							
995							
1005							
1015							
1025							
1035							
1045							
1055							
1065							
1075							
1085							
1095							
1105							
1115							

LITHOLOGIC LOG					R-09
					File No. 129687 Sheet No. 14 of 15
VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION					
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)		
-360				1117 QUARTZ MONZONITE (840-1200 feet) Continued	
-355					
-350					
-345					
-340					
-335					
-330					
-325					
-320					
-315					
-310					
-305					
-300					
-295					
-290					
-285					
-280					
-275					
-270				1200 GRANODIORITE 1200-1244 feet Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%. Abundance of gray clay.	
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					R-09

HALEY ALDRICH LITHOLOGIC LOG					R-09 File No. 129687 Sheet No. 15 of 15
VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION					
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)		
-1205	1204			GRANODIORITE 1200-1244 feet) Continued	
-270					
-1210					
-265					
-1215					
-260					
-1220					
-255					
-1225					
-250					
-1230					
-245					
-1235					
-240					
-1240					
-235	1244				

APPENDIX C

Chemical Characteristics of Formation Water



May 23, 2018

Barbara Sylvester
Brown & Caldwell
201 E. Washington Suite 500
Phoenix, AZ 85004

TEL (602) 567-3894
FAX -

RE: PTF

Work Order No.: 18D0619
Order Name: Florence Copper

Dear Barbara Sylvester,

Turner Laboratories, Inc. received 2 sample(s) on 04/25/2018 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

A handwritten signature in black ink that appears to read "Kevin Brim".

Kevin Brim
Project Manager

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Order: Florence Copper

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
18D0619-01	R-09	Ground Water	04/23/2018 1555
18D0619-02	TB	Ground Water	04/25/2018 0000

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Case Narrative

The 8015D analysis was performed by TestAmerica Laboratories, Inc. in Phoenix, AZ.

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

D5 Minimum Reporting Limit (MRL) is adjusted due to sample dilution; analyte was non-detect in the sample.

H5 This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

M3 The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated LCS/LCSD recovery was acceptable.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND Not Detected at or above the PQL

PQL Practical Quantitation Limit

DF Dilution Factor

PRL Project Reporting Limit

Turner Laboratories, Inc.**Date: 05/23/2018**

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-01

Client Sample ID: R-09
Collection Date/Time: 04/23/2018 1555
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
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ICP Dissolved Metals-E 200.7 (4.4)

Calcium	140	4.0	M3	mg/L	1	04/27/2018	1440	05/04/2018	1150	MH
Iron	ND	0.30		mg/L	1	04/27/2018	1440	05/04/2018	1150	MH
Magnesium	27	3.0		mg/L	1	04/27/2018	1440	05/04/2018	1150	MH
Potassium	6.8	5.0		mg/L	1	04/27/2018	1440	05/04/2018	1150	MH
Sodium	170	5.0	M3	mg/L	1	04/27/2018	1440	05/04/2018	1150	MH

ICP/MS Dissolved Metals-E 200.8 (5.4)

Aluminum	ND	0.0800	D5	mg/L	2	04/27/2018	1440	05/07/2018	1139	MH
Antimony	ND	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Arsenic	0.0016	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Barium	0.071	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Beryllium	ND	0.00050	D5	mg/L	2	04/27/2018	1440	05/07/2018	1139	MH
Cadmium	ND	0.00025		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Chromium	0.0051	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Cobalt	ND	0.00025		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Copper	0.011	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Lead	ND	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Manganese	0.0020	0.00025		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Nickel	0.0033	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Selenium	ND	0.0025		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Thallium	ND	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Zinc	ND	0.040		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH

CVAA Dissolved Mercury-E 245.1

Mercury	ND	0.0010		mg/L	1	04/26/2018	0955	04/26/2018	1639	MH
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pH-E150.1

pH (pH Units)	7.8	H5	-	1	04/26/2018	1615	04/26/2018	1616	AP
Temperature (°C)	22	H5	-	1	04/26/2018	1615	04/26/2018	1616	AP

ICP/MS Total Metals-E200.8 (5.4)

Uranium	0.016	0.00050		mg/L	1	04/27/2018	1230	04/30/2018	1348	MH
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Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-01

Client Sample ID: R-09
Collection Date/Time: 04/23/2018 1555
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Anions by Ion Chromatography-E300.0 (2.1)									
Chloride	310		25		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Fluoride	ND		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrate (As N)	8.8		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrite (As N)	ND		0.10		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Sulfate	190		130		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Cyanide-E335.4									
Cyanide	ND		0.10		mg/L	1	04/26/2018 0845	04/30/2018 1545	AP
Alkalinity-SM2320B									
Alkalinity, Bicarbonate (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Carbonate (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Hydroxide (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Phenolphthalein (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Total (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Specific Conductance-SM2510 B									
Conductivity	1700		0.20		μmhos/cm	2	05/09/2018 1315	05/09/2018 1330	AP
Total Dissolved Solids (Residue, Filterable)-SM2540 C									
Total Dissolved Solids (Residue, Filterable)	1000		20		mg/L	1	04/26/2018 0826	05/01/2018 1600	EJ
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
<i>Surr: 4-Bromofluorobenzene</i>	95	70-130		%REC	1	05/07/2018 1824	05/07/2018 1943	KP	
<i>Surr: Dibromofluoromethane</i>	101	70-130		%REC	1	05/07/2018 1824	05/07/2018 1943	KP	
<i>Surr: Toluene-d8</i>	77	70-130		%REC	1	05/07/2018 1824	05/07/2018 1943	KP	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-02

Client Sample ID: TB
Collection Date/Time: 04/25/2018 0000
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
<i>Surr: 4-Bromofluorobenzene</i>	101	70-130		%REC	1	05/07/2018 1824	05/07/2018 2344	KP	
<i>Surr: Dibromofluoromethane</i>	110	70-130		%REC	1	05/07/2018 1824	05/07/2018 2344	KP	
<i>Surr: Toluene-d8</i>	103	70-130		%REC	1	05/07/2018 1824	05/07/2018 2344	KP	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD RPD	RPD Limit Qual	
Batch 1804269 - E 245.1									
Blank (1804269-BLK1) Prepared & Analyzed: 04/26/2018									
Mercury	ND	0.0010	mg/L						
LCS (1804269-BS1) Prepared & Analyzed: 04/26/2018									
Mercury	0.0049	0.0010	mg/L	0.005000	98	85-115			
LCS Dup (1804269-BSD1) Prepared & Analyzed: 04/26/2018									
Mercury	0.0048	0.0010	mg/L	0.005000	95	85-115	2	20	
Matrix Spike (1804269-MS1) Source: 18D0394-01 Prepared & Analyzed: 04/26/2018									
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	97	85-115		
Matrix Spike Dup (1804269-MSD1) Source: 18D0394-01 Prepared & Analyzed: 04/26/2018									
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	96	85-115	1	20
Batch 1804292 - E200.8 (5.4)									
Blank (1804292-BLK1) Prepared & Analyzed: 04/30/2018									
Uranium	ND	0.00050	mg/L						
LCS (1804292-BS1) Prepared & Analyzed: 04/30/2018									
Uranium	0.046	0.00050	mg/L	0.05000	92	85-115			
LCS Dup (1804292-BSD1) Prepared & Analyzed: 04/30/2018									
Uranium	0.046	0.00050	mg/L	0.05000	92	85-115	0.2	20	
Matrix Spike (1804292-MS1) Source: 18D0614-01 Prepared & Analyzed: 04/30/2018									
Uranium	0.051	0.00050	mg/L	0.05000	0.0015	99	70-130		
Batch 1805051 - E 200.7 (4.4)									
Blank (1805051-BLK1) Prepared & Analyzed: 05/04/2018									
Calcium	ND	4.0	mg/L						
Iron	ND	0.30	mg/L						
Magnesium	ND	3.0	mg/L						
Potassium	ND	5.0	mg/L						
Sodium	ND	5.0	mg/L						
LCS (1805051-BS1) Prepared & Analyzed: 05/04/2018									
Calcium	11	4.0	mg/L	10.00	109	85-115			
Iron	1.0	0.30	mg/L	1.000	104	85-115			
Magnesium	10	3.0	mg/L	10.00	105	85-115			
Potassium	10	5.0	mg/L	10.00	105	85-115			
Sodium	10	5.0	mg/L	10.00	105	85-115			
LCS Dup (1805051-BSD1) Prepared & Analyzed: 05/04/2018									
Calcium	11	4.0	mg/L	10.00	110	85-115	1	20	
Iron	1.0	0.30	mg/L	1.000	105	85-115	0.5	20	
Magnesium	10	3.0	mg/L	10.00	105	85-115	0.06	20	
Potassium	10	5.0	mg/L	10.00	105	85-115	0.05	20	
Sodium	11	5.0	mg/L	10.00	109	85-115	4	20	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD RPD	RPD Limit	RPD Qual
Batch 1805051 - E 200.7 (4.4)										
Matrix Spike (1805051-MS1)										
Source: 18D0619-01 Prepared & Analyzed: 05/04/2018										
Calcium	150	4.0	mg/L	10.00	140	59	70-130		M3	
Iron	1.1	0.30	mg/L	1.000	0.028	105	70-130			
Magnesium	38	3.0	mg/L	10.00	27	108	70-130			
Potassium	17	5.0	mg/L	10.00	6.8	105	70-130			
Sodium	170	5.0	mg/L	10.00	170	30	70-130		M3	
Matrix Spike (1805051-MS2)										
Source: 18E0021-01 Prepared & Analyzed: 05/04/2018										
Calcium	64	4.0	mg/L	10.00	54	103	70-130			
Iron	1.0	0.30	mg/L	1.000	0.0060	101	70-130			
Magnesium	21	3.0	mg/L	10.00	11	99	70-130			
Potassium	15	5.0	mg/L	10.00	4.7	104	70-130			
Sodium	99	5.0	mg/L	10.00	90	87	70-130			
Batch 1805069 - E 200.8 (5.4)										
Blank (1805069-BLK1)										
Prepared & Analyzed: 05/07/2018										
Aluminum	ND	0.0400	mg/L							
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Barium	ND	0.00050	mg/L							
Beryllium	ND	0.00025	mg/L							
Cadmium	ND	0.00025	mg/L							
Chromium	ND	0.00050	mg/L							
Cobalt	ND	0.00025	mg/L							
Copper	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Manganese	ND	0.00025	mg/L							
Nickel	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Zinc	ND	0.040	mg/L							
LCS (1805069-BS1)										
Prepared & Analyzed: 05/07/2018										
Aluminum	0.104	0.0400	mg/L	0.1000	104	85-115				
Antimony	0.048	0.00050	mg/L	0.05000	96	85-115				
Arsenic	0.050	0.00050	mg/L	0.05000	100	85-115				
Barium	0.050	0.00050	mg/L	0.05000	100	85-115				
Beryllium	0.049	0.00025	mg/L	0.05000	97	85-115				
Cadmium	0.050	0.00025	mg/L	0.05000	100	85-115				
Chromium	0.051	0.00050	mg/L	0.05000	102	85-115				
Cobalt	0.051	0.00025	mg/L	0.05000	101	85-115				
Copper	0.051	0.00050	mg/L	0.05000	103	85-115				
Lead	0.049	0.00050	mg/L	0.05000	98	85-115				
Manganese	0.050	0.00025	mg/L	0.05000	101	85-115				
Nickel	0.051	0.00050	mg/L	0.05000	102	85-115				
Selenium	0.051	0.0025	mg/L	0.05000	103	85-115				
Thallium	0.050	0.00050	mg/L	0.05000	101	85-115				
Zinc	0.10	0.040	mg/L	0.1000	101	85-115				

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD RPD	RPD Limit	RPD Qual
Batch 1805069 - E 200.8 (5.4)										
LCS Dup (1805069-BSD1)										
Prepared & Analyzed: 05/07/2018										
Aluminum	0.115	0.0400	mg/L	0.1000	115	85-115	10	20		
Antimony	0.048	0.00050	mg/L	0.05000	96	85-115	0.7	20		
Arsenic	0.050	0.00050	mg/L	0.05000	101	85-115	0.8	20		
Barium	0.051	0.00050	mg/L	0.05000	102	85-115	1	20		
Beryllium	0.049	0.00025	mg/L	0.05000	97	85-115	0.2	20		
Cadmium	0.050	0.00025	mg/L	0.05000	100	85-115	0.2	20		
Chromium	0.051	0.00050	mg/L	0.05000	102	85-115	0.4	20		
Cobalt	0.050	0.00025	mg/L	0.05000	101	85-115	0.5	20		
Copper	0.052	0.00050	mg/L	0.05000	105	85-115	2	20		
Lead	0.049	0.00050	mg/L	0.05000	98	85-115	0.1	20		
Manganese	0.050	0.00025	mg/L	0.05000	101	85-115	0.09	20		
Nickel	0.051	0.00050	mg/L	0.05000	103	85-115	0.8	20		
Selenium	0.052	0.0025	mg/L	0.05000	104	85-115	2	20		
Thallium	0.050	0.00050	mg/L	0.05000	101	85-115	0.06	20		
Zinc	0.10	0.040	mg/L	0.1000	104	85-115	3	20		
Matrix Spike (1805069-MS1)										
Source: 18D0693-01										
Prepared & Analyzed: 05/07/2018										
Aluminum	0.239	0.0400	mg/L	0.1000	0.166	74	70-130			
Antimony	0.045	0.00050	mg/L	0.05000	0.00024	90	70-130			
Arsenic	0.056	0.00050	mg/L	0.05000	0.0035	104	70-130			
Barium	0.16	0.00050	mg/L	0.05000	0.12	94	70-130			
Beryllium	0.045	0.00025	mg/L	0.05000	0.000029	90	70-130			
Cadmium	0.047	0.00025	mg/L	0.05000	ND	94	70-130			
Chromium	0.049	0.00050	mg/L	0.05000	0.00052	98	70-130			
Cobalt	0.048	0.00025	mg/L	0.05000	0.00097	95	70-130			
Copper	0.051	0.00050	mg/L	0.05000	0.0020	98	70-130			
Lead	0.047	0.00050	mg/L	0.05000	0.00016	94	70-130			
Manganese	0.054	0.00025	mg/L	0.05000	0.0075	94	70-130			
Nickel	0.049	0.00050	mg/L	0.05000	0.0018	94	70-130			
Selenium	0.057	0.0025	mg/L	0.05000	ND	114	70-130			
Thallium	0.048	0.00050	mg/L	0.05000	0.000038	96	70-130			
Zinc	0.11	0.040	mg/L	0.1000	ND	109	70-130			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD RPD	RPD Limit	RPD Qual
Batch 1804261 - SM2540 C										
Duplicate (1804261-DUP1) Source: 18D0606-01 Prepared: 04/26/2018 Analyzed: 04/27/2018										
Total Dissolved Solids (Residue, Filterable)										
630 20 mg/L 630 0.3 5										
Duplicate (1804261-DUP2) Source: 18D0606-02 Prepared: 04/26/2018 Analyzed: 04/27/2018										
Total Dissolved Solids (Residue, Filterable)										
610 20 mg/L 620 0.8 5										
Batch 1804268 - E335.4										
Blank (1804268-BLK1) Prepared: 04/26/2018 Analyzed: 04/30/2018										
Cyanide										
ND 0.10 mg/L										
LCS (1804268-BS1) Prepared: 04/26/2018 Analyzed: 04/30/2018										
Cyanide										
2.0 0.10 mg/L 2.000 101 90-110										
LCS Dup (1804268-BSD1) Prepared: 04/26/2018 Analyzed: 04/30/2018										
Cyanide										
2.0 0.10 mg/L 2.000 101 90-110 0.1 20										
Matrix Spike (1804268-MS1) Source: 18D0602-03 Prepared: 04/26/2018 Analyzed: 04/30/2018										
Cyanide										
2.1 0.10 mg/L 2.000 ND 103 90-110										
Matrix Spike Dup (1804268-MSD1) Source: 18D0602-03 Prepared: 04/26/2018 Analyzed: 04/30/2018										
Cyanide										
2.0 0.10 mg/L 2.000 ND 98 90-110 5 20										
Batch 1804272 - E150.1										
Duplicate (1804272-DUP1) Source: 18D0662-02 Prepared & Analyzed: 04/26/2018										
pH (pH Units)										
7.8 - 7.8 0.1 200 H5										
Temperature (°C)										
21 - 21 2 200 H5										
Batch 1805027 - SM2320B										
LCS (1805027-BS1) Prepared & Analyzed: 05/03/2018										
Alkalinity, Total (As CaCO ₃)										
240 2.0 mg/L 250.0 96 90-110										
LCS Dup (1805027-BSD1) Prepared & Analyzed: 05/03/2018										
Alkalinity, Total (As CaCO ₃)										
240 2.0 mg/L 250.0 96 90-110 0 10										
Matrix Spike (1805027-MS1) Source: 18D0606-02 Prepared & Analyzed: 05/03/2018										
Alkalinity, Total (As CaCO ₃)										
370 2.0 mg/L 250.0 130 96 85-115										
Matrix Spike Dup (1805027-MSD1) Source: 18D0606-02 Prepared & Analyzed: 05/03/2018										
Alkalinity, Total (As CaCO ₃)										
370 2.0 mg/L 250.0 130 95 85-115 0.5 10										
Batch 1805103 - SM2510 B										
LCS (1805103-BS1) Prepared & Analyzed: 05/09/2018										
Conductivity										
140 0.10 μmhos/cm 141.2 101 0-200										
LCS Dup (1805103-BSD1) Prepared & Analyzed: 05/09/2018										
Conductivity										
140 0.10 μmhos/cm 141.2 101 0-200 0.7 200										
Duplicate (1805103-DUP1) Source: 18E0192-01 Prepared & Analyzed: 05/09/2018										
Conductivity										
4.0 0.10 μmhos/cm 4.0 0 10										

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD RPD	RPD Limit	RPD Qual
Batch 1805074 - SW8260B										
Blank (1805074-BLK1)										
Prepared & Analyzed: 05/07/2018										
Benzene	ND	0.50	ug/L							
Carbon disulfide	ND	2.0	ug/L							
Ethylbenzene	ND	0.50	ug/L							
Toluene	ND	0.50	ug/L							
Xylenes, Total	ND	1.5	ug/L							
<i>Surrogate: 4-Bromofluorobenzene</i>	25.0		ug/L	25.00		100	70-130			
<i>Surrogate: Dibromofluoromethane</i>	26.9		ug/L	25.00		107	70-130			
<i>Surrogate: Toluene-d8</i>	25.1		ug/L	25.00		100	70-130			
LCS (1805074-BS1)										
Prepared & Analyzed: 05/07/2018										
1,1-Dichloroethene	29		ug/L	25.00		114	70-130			
Benzene	27		ug/L	25.00		109	70-130			
Chlorobenzene	29		ug/L	25.00		115	70-130			
Toluene	25		ug/L	25.00		101	70-130			
Trichloroethene	26		ug/L	25.00		103	70-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	24.6		ug/L	25.00		98	70-130			
<i>Surrogate: Dibromofluoromethane</i>	25.6		ug/L	25.00		102	70-130			
<i>Surrogate: Toluene-d8</i>	24.8		ug/L	25.00		99	70-130			
LCS Dup (1805074-BSD1)										
Prepared & Analyzed: 05/07/2018										
1,1-Dichloroethene	27		ug/L	25.00		110	70-130	4	30	
Benzene	26		ug/L	25.00		104	70-130	5	30	
Chlorobenzene	26		ug/L	25.00		105	70-130	9	30	
Toluene	24		ug/L	25.00		96	70-130	5	30	
Trichloroethene	25		ug/L	25.00		98	70-130	4	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	24.4		ug/L	25.00		98	70-130			
<i>Surrogate: Dibromofluoromethane</i>	26.1		ug/L	25.00		104	70-130			
<i>Surrogate: Toluene-d8</i>	25.1		ug/L	25.00		100	70-130			
Matrix Spike (1805074-MS1)										
Source: 18D0582-02										
Prepared & Analyzed: 05/07/2018										
1,1-Dichloroethene	27		ug/L	25.00	0.070	109	70-130			
Benzene	26		ug/L	25.00	0.020	104	70-130			
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130			
Toluene	27		ug/L	25.00	3.5	95	70-130			
Trichloroethene	24		ug/L	25.00	0.040	97	70-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	24.4		ug/L	25.00		98	70-130			
<i>Surrogate: Dibromofluoromethane</i>	26.4		ug/L	25.00		106	70-130			
<i>Surrogate: Toluene-d8</i>	24.9		ug/L	25.00		100	70-130			
Matrix Spike Dup (1805074-MSD1)										
Source: 18D0582-02										
Prepared & Analyzed: 05/07/2018										
1,1-Dichloroethene	27		ug/L	25.00	0.070	108	70-130	0.8	30	
Benzene	25		ug/L	25.00	0.020	101	70-130	2	30	
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130	0.3	30	
Toluene	27		ug/L	25.00	3.5	95	70-130	0.1	30	
Trichloroethene	24		ug/L	25.00	0.040	95	70-130	2	30	
<i>Surrogate: 4-Bromofluorobenzene</i>	24.7		ug/L	25.00		99	70-130			
<i>Surrogate: Dibromofluoromethane</i>	26.4		ug/L	25.00		106	70-130			
<i>Surrogate: Toluene-d8</i>	25.3		ug/L	25.00		101	70-130			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD RPD	RPD Limit Qual
Batch 1804245 - E300.0 (2.1)								
Blank (1804245-BLK1)								
Chloride	ND	1.0	mg/L					
Fluoride	ND	0.50	mg/L					
Nitrogen, Nitrate (As N)	ND	0.50	mg/L					
Nitrogen, Nitrite (As N)	ND	0.10	mg/L					
Sulfate	ND	5.0	mg/L					
LCS (1804245-BS1)								
Chloride	12	1.0	mg/L	12.50	92	90-110		
Fluoride	2.0	0.50	mg/L	2.000	101	90-110		
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	95	90-110		
Nitrogen, Nitrite (As N)	2.3	0.10	mg/L	2.500	92	90-110		
Sulfate	12	5.0	mg/L	12.50	96	90-110		
LCS Dup (1804245-BSD1)								
Chloride	12	1.0	mg/L	12.50	94	90-110	2	10
Fluoride	2.0	0.50	mg/L	2.000	101	90-110	0.4	10
Nitrogen, Nitrate (As N)	4.9	0.50	mg/L	5.000	98	90-110	3	10
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500	95	90-110	3	10
Sulfate	12	5.0	mg/L	12.50	98	90-110	3	10
Matrix Spike (1804245-MS1)								
Source: 18D0613-08				Prepared & Analyzed: 04/25/2018				
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120	
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	89	80-120	
Matrix Spike (1804245-MS2)								
Source: 18D0625-01				Prepared & Analyzed: 04/26/2018				
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000	0.46	92	80-120	
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120	
Matrix Spike (1804245-MS3)								
Source: 18D0614-01RE1				Prepared & Analyzed: 04/26/2018				
Chloride	17		mg/L	12.50	6.4	88	80-120	
Sulfate	28		mg/L	12.50	18	85	80-120	
Matrix Spike Dup (1804245-MSD1)								
Source: 18D0613-08				Prepared & Analyzed: 04/25/2018				
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120	0.4
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	90	80-120	0.6
Matrix Spike Dup (1804245-MSD2)								
Source: 18D0625-01				Prepared & Analyzed: 04/26/2018				
Nitrogen, Nitrate (As N)	5.1	0.50	mg/L	5.000	0.46	92	80-120	0.2
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120	0.4
Matrix Spike Dup (1804245-MSD3)								
Source: 18D0614-01RE1				Prepared & Analyzed: 04/26/2018				
Chloride	18		mg/L	12.50	6.4	89	80-120	0.6
Sulfate	29		mg/L	12.50	18	86	80-120	0.6

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Phoenix

4625 East Cotton Ctr Blvd

Suite 189

Phoenix, AZ 85040

Tel: (602)437-3340

[TestAmerica Job ID: 550-101943-1](#)

Client Project/Site: 18D0619

For:

Turner Laboratories, Inc.

2445 North Coyote Drive

Suite 104

Tucson, Arizona 85745

Attn: Kevin Brim

Authorized for release by:

5/16/2018 12:23:25 PM

Ken Baker, Project Manager II

(602)659-7624

ken.baker@testamericainc.com

LINKS

Review your project
results through

TotalAccess

Have a Question?

Ask
The
Expert

Visit us at:

www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
Q9	Insufficient sample received to meet method QC requirements.

Glossary

Abbreviation **These commonly used abbreviations may or may not be present in this report.**

□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Narrative

**Job Narrative
550-101943-1**

Comments

No additional comments.

Receipt

The sample was received on 4/27/2018 10:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8° C.

GC Semi VOA

Method(s) 8015D: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD) associated with preparation batch 550-145985 and analytical batch 550-146884. Affected samples have been added a Q9 qualifier.
18D0619-01 (550-101943-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3510C.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-101943-1	18D0619-01	Water	04/23/18 15:55	04/27/18 10:50

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TestAmerica Phoenix

Detection Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Lab Sample ID: 550-101943-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
ORO (C22-C32)	0.21	Q9	0.20	mg/L	1		8015D	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Phoenix

Client Sample Results

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Lab Sample ID: 550-101943-1

Matrix: Water

Date Collected: 04/23/18 15:55
Date Received: 04/27/18 10:50

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	0.21	Q9	0.20	mg/L	04/30/18 14:16	05/10/18 23:29		1
DRO (C10-C22)	ND	Q9	0.10	mg/L	04/30/18 14:16	05/10/18 23:29		1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
<i>o-Terphenyl (Surr)</i>	79		10 - 150			04/30/18 14:16	05/10/18 23:29	1

Surrogate Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Water

Prep Type: Total/NA

Surrogate Legend

OTPH = o-Terphenyl (Surr)

QC Sample Results

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 550-145985/1-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 145985

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	ND		0.20	mg/L		04/30/18 14:15	05/11/18 11:16	1
DRO (C10-C22)	ND		0.10	mg/L		04/30/18 14:15	05/11/18 11:16	1
Surrogate	MB %Recovery	MB Qualifier	Limits			Prepared	Analyzed	Dil Fac
<i>o-Terphenyl (Surr)</i>	65		10 - 150			04/30/18 14:15	05/11/18 11:16	1

Lab Sample ID: LCS 550-145985/2-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 145985

Analyte		Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec.	
ORO (C22-C32)		1.60	1.59		mg/L		99	69 - 107
DRO (C10-C22)		0.400	0.450		mg/L		113	42 - 133
Surrogate		LCS %Recovery	LCS Qualifier	Limits				Limits
<i>o-Terphenyl (Surr)</i>		79		10 - 150				

Lab Sample ID: LCSD 550-145985/3-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 145985

Analyte		Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec.		RPD	
ORO (C22-C32)		1.60	1.59		mg/L		100	69 - 107	0	20
DRO (C10-C22)		0.400	0.447		mg/L		112	42 - 133	1	22
Surrogate		LCSD %Recovery	LCSD Qualifier	Limits				Limits	RPD	Limit
<i>o-Terphenyl (Surr)</i>		79		10 - 150						

TestAmerica Phoenix

QC Association Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

GC Semi VOA

Prep Batch: 145985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	3510C	
MB 550-145985/1-A	Method Blank	Total/NA	Water	3510C	
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 146884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	8015D	145985
MB 550-145985/1-A	Method Blank	Total/NA	Water	8015D	145985
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	8015D	145985
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	8015D	145985

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Lab Chronicle

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Lab Sample ID: 550-101943-1

Matrix: Water

Date Collected: 04/23/18 15:55

Date Received: 04/27/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			145985	04/30/18 14:16	REM	TAL PHX
Total/NA	Analysis	8015D		1	146884	05/10/18 23:29	TC1	TAL PHX

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

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TestAmerica Phoenix

Accreditation/Certification Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-18
Analysis Method	Prep Method	Matrix	Analyte	

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TestAmerica Phoenix

Method Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method	Method Description	Protocol	Laboratory
8015D	Diesel Range Organics (DRO) (GC)	SW846	TAL PHX
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL PHX

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

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TestAmerica Phoenix

SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619
101943SENDING LABORATORY:

Turner Laboratories, Inc.
 2445 N. Coyote Drive, Ste #104
 Tucson, AZ 85745
 Phone: 520.882.5880
 Fax: 520.882.9788
 Project Manager: Kevin Brim

RECEIVING LABORATORY:

TestAmerica Phoenix
 4625 East Cotton Center Boulevard Suite 189
 Phoenix, AZ 85540
 Phone :(602) 437-3340
 Fax:
 Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
-01			
Sample ID: 18D0619-01 Drinking Water Sampled:04/23/2018 15:55	04/30/2018 15:55	8015D Sub	8015D DRO and ORO Paramters Only

Containers Supplied:

8015D Sub
 o-Terphenyl
 C10-C32 (Total)
 C22-C32 (Oil Range Organics)
 C10-C22 (Diesel Range Organics)
 C6-C10 (Gasoline Range Organics)



TA-PHX

3,8' L UPS GR

Released By

41263118

Date

Received By

Released By

Date

Received By

Date

Login Sample Receipt Checklist

Client: Turner Laboratories, Inc.

Job Number: 550-101943-1

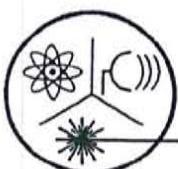
Login Number: 101943

List Source: TestAmerica Phoenix

List Number: 1

Creator: Gravlin, Andrea

Question	Answer	Comment	
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True		1
The cooler's custody seal, if present, is intact.	True		2
Sample custody seals, if present, are intact.	True		3
The cooler or samples do not appear to have been compromised or tampered with.	True		4
Samples were received on ice.	True		5
Cooler Temperature is acceptable.	True		6
Cooler Temperature is recorded.	True		7
COC is present.	True		8
COC is filled out in ink and legible.	True		9
COC is filled out with all pertinent information.	True		10
Is the Field Sampler's name present on COC?	True		11
There are no discrepancies between the containers received and the COC.	True		12
Samples are received within Holding Time (excluding tests with immediate HTs)	True		13
Sample containers have legible labels.	True		14
Containers are not broken or leaking.	True		15
Sample collection date/times are provided.	True		
Appropriate sample containers are used.	True		
Sample bottles are completely filled.	True		
Sample Preservation Verified.	True		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True		
Multiphasic samples are not present.	True		
Samples do not require splitting or compositing.	True		
Residual Chlorine Checked.	False	Check done at department level as required.	



Radiation Safety Engineering, Inc.

3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121

Website: www.radsafe.com

(480) 897-9459

FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

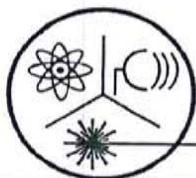
Sampling Date: April 23, 2018
Sample Received: May 01, 2018
Analysis Completed: May 22, 2018

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Uranium Activity Method ASTM D6239 (pCi/L)	Adjusted Gross Alpha (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
18D0619-01	17.7 ± 0.9	12.9 ± 1.2	4.8 ± 1.5	3.1 ± 0.3	3.1 ± 0.4	6.2 ± 0.5

Date of Analysis	5/2/2018	5/21/2018	5/21/2018	5/4/2018	5/4/2018	5/4/2018
------------------	----------	-----------	-----------	----------	----------	----------

Alt 2. retest

Robert L. Metzger, Ph.D., C.H.P. Date _____
Laboratory License Number AZ0462



Radiation Safety Engineering, Inc.

3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121

Website: www.radsafe.com

(480) 897-9459

FAX (480) 892-5446

Isotopic Uranium Analysis

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018

Sample Received: May 01, 2018

Uranium Analysis Date: May 21, 2018

Sample No.	^{238}U	^{235}U	^{234}U	Total	
18D0619-01	6.0 ± 0.6	0.280 ± 0.004	6.6 ± 0.6	12.9 ± 1.2	Activity (pCi/L)
	17.9 ± 1.7	0.131 ± 0.002	0.00106 ± 0.00010	18.0 ± 1.7	Content ($\mu\text{g}/\text{L}$)
Comments:					

RL Metzger
Robert L. Metzger, Ph.D., C.H.P.
Laboratory License Number AZ0462

5/22/2018

Date

Arizona Department of Environmental Quality
Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report
 Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

April 23, 2018 15:55 (24 hour clock)
 Sample Date Sample Time Owner/Contact Person

Owner/Contact Fax Number Owner/Contact Phone Number

Sample Collection Point
 EPDS # _____

Compliance Sample Type:

- Reduced Monitoring
- Quarterly
- Composite of four quarterly samples

Date Q1 collected: _____
 Date Q2 collected: _____
 Date Q3 collected: _____
 Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000	5/21/2018	4.8 ± 1.5	
600/00-02		3 pCi/L	Gross Alpha	4002	5/2/2018	17.7 ± 0.9	
7500 - Rn			Radon	4004			
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006	5/21/2018	18.0 ± 1.7 µg/L	
			Uranium 234	4007	5/21/2018	0.00106 ± 0.00010	
			Uranium 235	4008	5/21/2018	0.131 ± 0.002	
			Uranium 238	4009	5/21/2018	17.9 ± 1.7	
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	5/4/2018	6.2 ± 0.5	X
GammaRay HPGE		1 pCi/L	Radium 226	4020	5/4/2018	3.1 ± 0.3	
GammaRay HPGE		1 pCi/L	Radium 228	4030	5/4/2018	3.1 ± 0.4	

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE60312

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 18D0619-01

Authorized Signature: *Robert L. Metzger*

Date Public Water System Notified:

DWAR 6: 11/2007

SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619

SENDING LABORATORY:

Turner Laboratories, Inc.
 2445 N. Coyote Drive, Ste #104
 Tucson, AZ 85745
 Phone: 520.882.5880
 Fax: 520.882.9788
 Project Manager: Kevin Brim

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
 3245 N. Washington St.
 Chandler, AZ 85225-1121
 Phone : (480) 897-9459
 Fax: (480) 892-5446
 Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 18D0619-01 Drinking Water Sampled:04/23/2018 15:55			
Radiochemistry, Gross Alpha	10/20/2018 15:55		Analyze Uranium and Adjusted Alpha if G. Alpha is > 12
Radiochemistry, Radium 226/228	05/23/2018 15:55		
<i>Containers Supplied:</i>			

*# 60312**[Signature]*4/30/18
Date16:00
ups

Received By

4/30/18
Date

16:00

Released By

Date

Received By

Date

APPENDIX D

Well Completion Documentation

PIPE TALLY

Project Name.: FLI PTF	Project No.: 129687-007
Well No.: R-09	Date: 12-11-17
Location: Florence	Pipe Tally for: Overburden
Total Depth:	Geologist: C Price

Type of Connections: Welded T+C Flush Thread Other

Notes:

16" LCS - Low-Carbon Steel

16" O.D. 15.38" ID

0.513 wall thickness,

Joint #2 polyethylene bonded.

SUMMARY OF TALLY	
Total Length tallied:	502.98
Casing Stick-Up:	
Length of Casing Cut-Off:	
Bottom of Well:	496.91
Screened Interval:	
Total Screen in Hole:	

Sensor Types:	Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing Conductivity Sensor (CS) 4 sensors with sing lead 20 ft spacing Electrical Resistivity Tomography (ERT)
---------------	---

HALEY
ALDRICH

SLV Volume & 29.3 yds
Pump 30 - 5747

ESTIMATED ANNULAR MATERIAL RECORD

Project Name: <u>KCL</u>	Project #: <u>129 687 007</u>	Date: <u>12/17/17</u>					
Well No.: <u>L-09</u>	Geologist: <u>Z. S. H.</u>						
ANNULAR VOLUME CALCULATIONS							
Total Depth of Borehole [T]: <u>56.1</u> feet	Total Cased Depth:	<u>59.7</u> feet					
Borehole Diameter [D]: <u>22</u> inches	Rat Hole Volume [$R=(D^2) 0.005454 * L$]:	<u>18.417</u> ft^3					
Screen Length [L_s]: <u>—</u> feet	Rat Hole Length [L_r]:	<u>7</u> feet					
Screen Diameter [d_s]: <u>—</u> inches	Camera Tube Length [L_{ct}]:	<u>—</u> feet					
Casing Length [L_c]: <u>—</u> feet	Camera Tube Diameter [d_{ct}]:	<u>—</u> inches					
Casing Diameter [d_c]: <u>16</u> inches							
Screen Annular Volume (A_s): $(D^2-d_s^2) 0.005454 =$	<u>1.24</u> $\text{ft}^3/\text{Lin. Ft}$						
Casing Annular Volume (A_c): $(D^2-d_c^2) 0.005454 =$	<u>—</u> $\text{ft}^3/\text{Lin. Ft}$						
Casing/Cam. Tube Annular Volume (A_{ct+ct}): $(D^2-d_{ct}^2) 0.005454 =$	<u>—</u> $\text{ft}^3/\text{Lin. Ft}$						
EQUATIONS							
2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet							
¹ Volume of bag (ft^3) = bag weight/100							
² Calculated depth = Previous Calculated depth - (y/A)							
No.	✓	Weight of Bag (lbs.)	Volume of Bag ¹ (y) (ft^3)	Total Vol. of Bags (ft ³)	Calculated Depth ² (ft bds)	Tagged Depth (ft bds)	Comments
1		<u>823.5</u>	<u>823.5</u>	<u>121.85</u>	<u>30.176</u>	<u>41.91</u>	<u>Type V cased (14.3 19.6) + 10.3 ft of sand</u>

243.4 + 810 + 18.470

PIPE TALLY

Project Name: FCG PTG	Project No.: 129067-007
Well No.: R-09	Date: 3/9/18 - 3/10/18
Location: Florence, AZ	Pipe Tally for: Longer
Total Depth: 3205.03'	Geologist: S. Hirsch & Smith

Type of Connections: Welded T+C Flush Thread Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
1	✓	0.31	0.31	SS End (AD)					
2	✓	19.61	19.92	PVC Screen					
3	★	19.61	39.57		14.39	ERT	12	1170.67	
4	✓	19.61	59.21						
5	★	19.61	78.83						
6	★	19.59	98.42		14.62	ERT	11	1111.52	
7	✓	19.63	118.02						
8	★	19.60	137.65						
9	✓	19.62	157.27		17.09	ERT	10	1050.27	
10	★	19.61	176.88						
11	✓	19.60	196.48						
12	★	19.62	216.10		18.45	ERT	9	990.09	
13	✓	19.68	235.68						
14	★	19.59	255.27						
15	✓	19.62	274.89						
16	★	19.61	294.48	▼	0.09	ERT	8	930.09	
17	✓	4.31	298.79	SS Blank					
18	✓	9.66	308.45						
19	✓	4.39	312.83	▼					
20	★	19.60	332.43	PVC Screen					
21	✓	19.62	352.05		2.51	ERT	7	870.09	
22	★	19.63	371.68						
23	✓	19.60	391.28						
24	★	19.62	410.90		3.75	ERT	6	810.30	
25	✓	19.60	430.50						
26	★	19.62	450.12						
27	✓	19.61	469.73		5.09	ERT	5	749.62	
28	★	19.60	489.33						
29	✓	19.63	508.96						
30	★	19.62	528.58	▼	6.42	ERT	4	689.06	

Notes:

SUMMARY OF TALLY	
Total Length tallied:	1206.36
Casing Stick-Up:	1.73
Length of Casing Cut-Off:	~
Bottom of Well:	1205.03
Screened Interval:	~
Total Screen in Hole:	1204-520' (44')

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
 Conductivity Sensor (CS) 4 sensors with sing lead 20 ft spacing
 Electrical Resistivity Tomography (ERT)

HALEY ALDRICH

PIPE TALLY

Project Name: FL-3 PT	Project No.: 1246047-002
Well No.: R-07	Date: 3/17/18 - 3/10/18
Location: Florence, AZ	Pipe Tally for: Block 1
Total Depth: 12,815.03	Geologist: S. Hensel Z. Smith

Type of Connections: Welded T+C Flush Thread Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
3.1	✓	9.30	537.4	SS Blank					
3.2	✓	9.38	547.78	↓					
3.3	#	19.64	636.92	PVC Screen	16.57	ERT			
3.4	✓	19.60	586.53		8.023 M	ERT, Transverse 3			630.08, 635.00
3.5	*	19.60	606.13						
3.6	✓	19.60	625.75						
3.7	*	19.64	645.39		9.76	ERT			
3.8	✓	19.60	664.99					2	669.92
3.9	*	19.62	684.61						
4.0	✓	0.50	685.11	SS Adapter					
4.1	*	30.04	715.27	Fiberglass		ERT			
4.2	✓	30.04	745.41						
4.3	*	30.15	775.56						
4.4	✓	30.13	805.68						
4.5	✓	30.13	835.82						
4.6	✓	30.02	865.84						
4.7	✓	30.01	895.85						
4.8	✓	30.13	925.98						
4.9	✓	29.98	955.96						
4.10	✓	30.02	985.98						
4.11	✓	30.07	1016.05						
4.12	✓	30.23	1046.28						
4.13	✓	30.23	1076.51						
4.14	✓	30.15	1106.66						
4.15	✓	30.01	1136.67						
4.16	✓	30.10	1166.77						
4.17	*	30.23	1197.00						
4.18	✓	2.96	1206.96	↓					
4.19	✓	4.23	1211.19	Temp FRP					

Notes:

- height of hole + J-bend + elevator above gravel surface B.I.B.

* Lasting (PIPE 34) did not length

- calculate stuck up = 1.73'

SUMMARY OF TALLY	
Total Length tallied:	12,06.96
Casing Stick-Up:	1.73
Length of Casing Cut-Off:	~
Bottom of Well:	12,05.03
Screened Interval:	~ 12,04 - 520'
Total Screen in Hole:	(640)'

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
 Conductivity Sensor (CS) 4 sensors with sing lead 20 ft spacing
 Electrical Resistivity Tomography (ERT)

HALEY ALDRICH

Casing Layout

Project Name.: Florence Copper INC				Project No.: 129687-007			
Well No.: R-09				Date: 3.9.18			
Location: Florence AZ				Layout for: Well Install			
Total Depth:				Geologist: Z. Smtih			
Pipe Length	Depth BGS	Pipe Length	Depth BGS	Pipe Length	Depth BGS	SENSOR DETAILS	
19.60	23	813.75	339.19		69	Sensor Type Sensor ID Pipe # Distance from Bottom of Sensor to Bottom of Pipe Depth of Sensor (BGS)	
		833.35	369.21		68	ERT 12 3 14.39 1170.67	1110.00
19.63	22	852.98	399.34		67	ERT 11 6 14.62 1111.58	1050.00
19.62	21	872.60	429.47		66	ERT 10 9 17.09 1050.29	990.00
19.60	20	892.20	459.62		65	ERT 9 12 18.45 990.09	930.00
4.38	19	896.58	489.76		64	ERT 8 16 0.05 930.09	870.00
9.66	18	906.24	519.92		63	ERT 7 21 2.51 870.09	810.00
4.31	17	910.55	520.42		62	ERT 6 24 3.75 810.00	750.00
19.59	16	930.14	540.04		61	ERT 5 27 5.09 749.82	690.00
19.62	15	949.76	559.64		60	ERT 4 30 6.42 689.65	630.00
19.59	14	969.35	579.28		-6.16	ERT 3 34 8.03 630.08	570.00
19.58	13	988.93	598.90		59	ERT 2 37 9.76 569.52	510.00
19.62	12	1008.55	618.50		58	ERT 1 41 10.86 509.06	
19.60	11	1028.15	638.11		57	Trans 1 34 3.11 635.00	
19.61	10	1047.76	657.75		56		#REF!
19.62	9	1067.38	667.13		55		#REF!
19.60	8	1086.98	676.45		54		#REF!
19.63	7	1106.61	696.07		53		
19.59	6	1126.20	715.70		52		
19.62	5	1145.82	735.30		51		
19.64	4	1165.46	754.91		50		
19.60	3	1185.06	774.53		49		
19.61	2	1204.67	794.13		48		
0.36	1	1205.03	813.75		47		
					46		
					45		
					44		
					43		
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					8		
					7		
					6		
					5		
					4		
					3		
					2		
					1		
					0.36		

Notes: Fiberglass joint for landing, pipe #55. 4.39' without coupler, 2 threads in on both ends. Stickup of deck, beam, plate, and elevator above surface casing = 5.99'. Top of Permanent FRP will be 1.78' above surface casing, 0.36' higher than target.

ESTIMATED ANNULAR MATERIAL RECORD

Project Name: FCI PTF
Well No.: Q-09

Project #: 129687-007
Geologist: S.Henze, S.Kanev, Z.Smith

Date: 3/11/18

ANNULAR VOLUME CALCULATIONS

Total Depth of Borehole [T]: 1236 feet
Borehole Diameter [D]: 14.75 inches
Screen Length [L_s]: 8 feet
Screen Diameter [d_s]: 8 inches
Casing Length [L_c]: 8 feet
Casing Diameter [d_c]: 8 inches

Total Cased Depth: 1205 feet
Rat Hole Volume [R=(D²) 0.005454*L_r]: 36.78 ft³
Rat Hole Length [L_r]: 31 feet
Camera Tube Length [L_{ct}]: — feet
Camera Tube Diameter [d_{ct}]: — inches

Screen Annular Volume (A_s): (D²-d_s²) 0.005454 = 0.84 ft³/Lin. Ft

Casing Annular Volume (A_c): (D²-d_c²) 0.005454 = 0.84 ft³/Lin. Ft

Casing/Cam.Tube Annular Volume (A_{c+ct}): (D²-d_c²-d_{ct}²) 0.005454 = — ft³/Lin. Ft

EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet

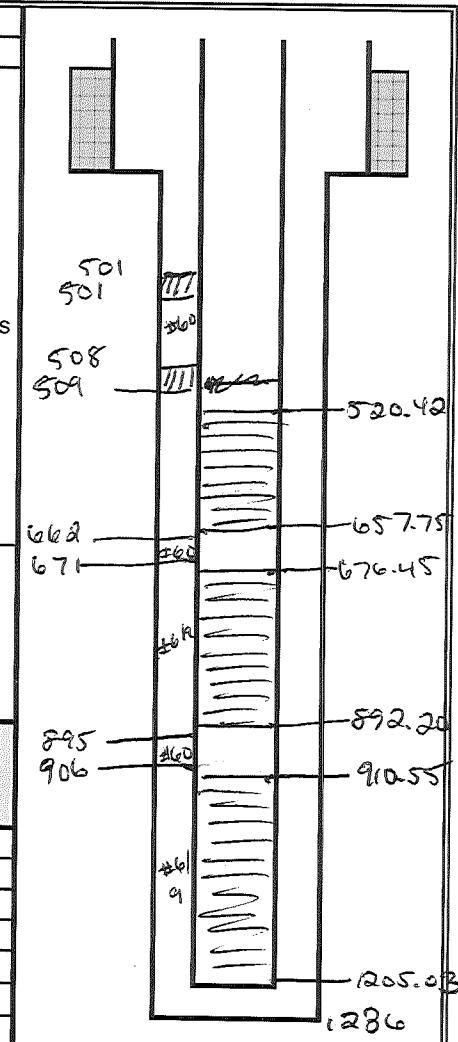
Bentonite Sack = 0.69 ft³

¹ Volume of bag (ft³) = bag weight/100

Silica Sand Super Sack = 3000 lbs.

² Calculated depth = Previous Calculated depth - (v/A)

No.	✓	Weight of Bag (lbs.)	Volume of Bag ¹ (v) (ft ³)	Total Vol. of Bags (ft ³)	Calculated Depth ² (ft bbls)	Tagged Depth (ft bbls)	Comments



See next page for details

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: FLI PFF
Well No.: R-07Project No.: 129687-607
Date: 3/11/18

Geologist: S. Hensel, Z. Smith

No.	✓	Weight of Bag (lbs.)	Volume of Bag ^{1(v)} (ft ³)	Total Vol. of Bags (ft ³)	Calculated Depth ^{2(k)} (ft bbls)	Tagged Depth (ft bbls)	Comments	
1	✓	3000	30	30	1210	—	S.S. #1 at 6 1/2 gravel	1204.13
2	✓	3000	30	60	1176	1145.42	S.S. #2 at 5 1/3 gravel	1173.56
3	✓	3000	30	90	1170	—	S.S. #3 at 5 1/2 gravel	1173.56
4	✓	3000	30	120	1145	1130	S.S. #4 at 6 1/4 gravel	1142.52
5	✓	3000	30	150	1000-1040	—	S.S. #5 at 6 1/4 gravel	1111.51
6	✓	3000	30	180	1030	1056	S.S. #6 at 6 1/4 gravel	1080.04
7	✓	3000	30	210	1015	1034	S.S. #7 at 6 1/4 gravel	1021.56
8	✓	3000	30	240	975	—	S.S. #8 at 6 1/4 gravel	958.06
9	✓	3000	30	270	940	958	S.S. #9 at 6 1/4 gravel	988.06
10	✓	3000	30	300	923	923	S.S. #10 at 3 1/2 gravel	924.87
11	✓	1500	15	315	910	905	CC # IV at 6 1/4 gravel - half bag	924.87
12	✓	—	—	—	908	—	Swabs 1200-1180	893.52
13	✓	—	—	—	912.896	—	Swabs 1200-1180	893.52
14	✓	—	—	—	896	—	Swabs 1200-1180	893.52
15	✓	—	—	—	900.62	—	Swabs 1100-1000	893.52
16	✓	—	—	—	897	—	Swabs 1100-1000	893.52
17	✓	—	—	—	897	—	Swabs 1100-1000	893.52
18	✓	—	—	—	899	—	Swabs 910-1000	893.52
19	✓	—	—	—	902	—	Swabs 910-1000	893.52
20	✓	—	—	—	931	931	Swabs 910-1000	893.52
21	✓	2000	20	335	912	915	#6/9 gravel 2/3 supersack	893.52
22	✓	1000	30-10	345	905.5	909.10	#6/9 gravel 1/3 "	893.52

Notes: ~~1. See field notes for info from 3/10/18. Over-night tags were incorrect. Needed to add 2 feet /100ft of tag line. Overnight was step th. subtracting. Will use rig 1's tag line that doesn't require conversion.~~

~~at 16 inch borehole $\rightarrow 1.05 \text{ ft}^3/\text{linear foot}$~~

P Didn't actually put in a whole supersack
Crushing interval with 5-gallon bucket makes this bag

* Calculated depths estimated using caliper log

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: ECI PTF
Well No.: 2-09Project No.: 129687-007
Date: 3/12/18

Geologist: S. Koenig, S. Hensel, B. Kibbey

No.	✓	Weight of Bag (lbs.)	Volume of Bag ^{1(v)} (ft ³)	Total Vol. of Bags (ft ³)	Calculated Depth ² (ft bbls)	Tagged Depth (ft bbls)	Comments	
23	✓	567	0.67	350.4	8905	905	#6/9 - 5gal buckets - x8	Terrain
		—	—	—	—	908	Swab 910'-1000' x 15 min	▲
		—	—	—	—	906	Swab 910'-1000' x 10 min	
		—	—	—	—	904	Swab 910'-1000' x 10 min	
		—	—	—	—	906	Swab 910'-1000' x 10 min	893.52
		—	—	—	—	906	Swab 910'-1000' x 10 min	893.52
24	✓	50	0.6	352.9	899	900	#6/9 sand x 15	
25	✓	50	0.5	360.4	898	900	#6/9 sand x 15	
26	✓	50	0.5	363.4	897	900	#6/9 sand x 15	893.52
27	✓	3000	30	393.4	866	862	3.5. #12 6/9 gravel	862.42
28	✓	1500	15	408.4	843	—	3.5. #12 6/9 gravel	831.87
29	✓	3600	30	428.4	818	—	3.5. #13 6/9 gravel	800.70
30	✓	3000	30	473.4	782.5	784	3.5. #14 6/9 gravel	770.9.00
31	✓	3000	30	478.4	761	—	3.5. #15 6/9 gravel	737.4
32	✓	3000	30	528.4	732.5	721	3.5. #16 6/9 gravel	705.88
33	✓	3000	30	553.4	688	693	3.5. #17 6/9 gravel	674.73
34	✓	1500	15	573.4	679	683	3.5. #18 6/9 gravel w/ bag	642.9
35	✓	1000	10	583.4	673.5	676	3.5. #18 6/9 gravel 1/2 bag	642.9
		—	—	—	—	680	Swab 790-890' x 15 min	
		—	—	—	—	680	Swab 790-890' x 10 min	
36	✓	1000	10	593.4	670.5	670	#6/9 13.55	
		—	—	—	—	671	Swab 695-790' x 15 mins	

Notes: ~~** based on 16" borehole → 1.05 ft/3 ft near foot~~~~*** See field notes for info on tag line discussion and verification.~~



58776428

R-09

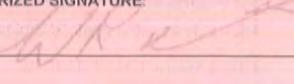
Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
003/4103							

Customer Code: Customer Name: Customer Job Number: Order Code / Date:
 Project Code: Project Name: Project P.O. Number: Order P.O. Number:
 Ticket Date: Delivery Address: Map Page: Map/Row/Column:
 Delivery Instructions: Dispatcher:
 BRING MAIN GATE*45/SIDE OF HUNT HWY & W 40 PINE PKWY*
 BRING BATCH RECORDS**TYPE IIA V CEMENT
 Ticket Number: 44354617

Due On Job: <input checked="" type="checkbox"/>	Slump: 11.00	Truck Number: 886	Driver Number: 2	Driver Name: JACKSON, KENNETH	End Use: BLDNG: OTHER
---	--------------	-------------------	------------------	-------------------------------	-----------------------

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
8.00	8.00	8.00	1333049	TYPE IIA SLURRY 21 SK CMT/W YD3			
1.00	1.00	1.00	1349968	PER DAY DELIVERY			
					OCT 19 PM 1:25		

<input type="checkbox"/> Cash	Check # / Auth Code:	Signature of Driver Receiving Cash:	Cash Received:	Total COD Order Amount to Collect Without Standby Charges:
<input type="checkbox"/> Check				
<input type="checkbox"/> Charge				

Comments:	WATER ADDED: _____ GAL YARDS IN DRUM: _____ WHEN ADDED.
	SIGNATURE
	CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST:
	SIGNATURE
	<input type="checkbox"/> LOAD WAS TESTED BY: _____
	SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. WARNING: Product may cause skin and/or eye irritation. CAUTION: Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.
	AUTHORIZED SIGNATURE: 

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. WARNING: Product may cause skin and/or eye irritation. CAUTION: Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

AUTHORIZED SIGNATURE:

(X)

92590790

41045465

**BASIC**
ENERGY SERVICES3451 LeTourneau
Gillette, WY 82718
307-682-5258

Cementing Ticket No. 1719 2128

Date	Customer Order No.	Sect.	Twp.	Range	Truck Called Out	On Location	Job Begun	Job Completed
12-12-17					21:30	19:45	12:30	2:00 a.m

Owner	Florence Copper Mine	Contractor	Hydro Resources	Charge To	Hydro West
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Mailing Address	City	State
-----------------	------	-------

Well No. & Form	R.09	Place	copper mine	County	Pinal	State AZ
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Depth of Well	Depth of Job	Casing (New) Used	Size Weight	22 inch type 2/5	Cement Left in casing by	Request Necessity	0 feet
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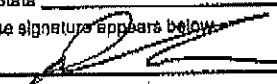
Kind of Job	surface	Drillpipe	Rotary	Tubing	Cable	Truck No.	28983
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Price Reference No.	Safety meeting held						
Price of Job	hook up hose to tubing						
Second Stage	pump 10 bbls of h2o ahead						
Pump Truck Mileage	mix and pump 625 sks of type 2/5						
P.U. Mileage	displace .5 bbl thru mixer						
Other Charges	release if any pressure (no pressure well on vac)						
Total Charges	unhook hose from tubing						
	wash up in cellar						
	released						

Cementer	Lead Yield	Lead Wt.	Lead Water	6.8	SV
Helper	Tail Yield	Tail Wt.	Lead Water		SV

District	Gillette	State	WY
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The above job was done under supervision of the owner, operator, or his agent whose signature appears below:

 Agent of contractor or operator

Sales Ticket for Materials Only

QUANTITY SACKS	BRAND AND TYPE	PRICE	TOTAL
16	Crew subsistence	500	8,000.00
10	Transportation of cement	150	1,500.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
Plugs			0.00
			0.00
Equipment#	HRS	625	Handling & Dumping
28983	1.5		Mileage
84127	1		Sub Total
			Discount 95%
			Sales Tax
			Total

Signature of operator



3451 LeTourneau
Gillette, WY 82718
307-682-5258

Cementing Ticket No. 1719 21387

Date 03-14-18	Customer Order No.	Sect.	Twp.	Range	Truck Called Out 4:30	On Location 5:30	Job Began 6:15	Job Completed 7:45
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Owner Florance Copper Mine	Contractor Hydro Resources	Charge To Hydro West
--------------------------------------	--------------------------------------	--------------------------------

Mailing Address	City	State
-----------------	------	-------

Well No. & Form R-09	Place copper mine	County Pinal	State AZ
--------------------------------	-----------------------------	------------------------	--------------------

Depth of Well 1225	Depth of Job 501	Casing (New) Size 8 5/8 Used Weight	Size of Hole 16 Amt. and Kind of Cement 2/5	(Cement Left in casing by) Request Necessity 0 feet
------------------------------	----------------------------	--	---	---

Kind of Job Recovery Well	Drillpipe Tubing 2 7/8	(Rotary Cable) Truck No. 28983
-------------------------------------	-------------------------------------	---

Price Reference No. 1210	Remarks safety meeting held
Price of Job	rig up to tubing with hose and valve
Second Stage	pump 5 bbls to clear tubing
Pump Truck Mileage 3825	pump and mix 350 sks type 2/5 cement
P.U. Mileage 765	displace .5 bbl thru mixer
Other Charges	rig down from tubing
Total Charges 5,800.00	wash up in cellar
	good cement to surface
	THANK YOU

Cementer Bryan Hammond	Lead Yield 1.38	Lead Wt. 14.6	Lead Water 6.8	SV 86
----------------------------------	---------------------------	-------------------------	--------------------------	-----------------

Helper Daniel Johnson	Tail Yield	Tail Wt.	Lead Water	SV
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District Gillette	State Wy
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The above job was done under supervision of the owner, operator, or his agent whose signature appears below.

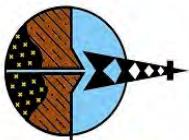
Agent of contractor or operator

Sales Ticket for Materials Only							
QUANTITY SACKS	BRAND AND TYPE			PRICE	TOTAL		
16	Crew subsistence			500	8,000.00		
12	Transportaton of cement			150	1,800.00		
					0.00		
	Expected 17.5=350 sks				0.00		
					0.00		
	P.O. # 152614				0.00		
					0.00		
					0.00		
					0.00		
					0.00		
					0.00		
					0.00		
					0.00		
					0.00		
Plugs					0.00		
Equipment #	HRS	350		Handling & Dumping	2.44		
28983	1.5			Mileage	0.00		
84127	1			Sub Total	16,454.00		
<i>Bryan Hammond</i>							
Discount							
Sales Tax							
Total							

Signature of operator

APPENDIX E

Geophysical Logs



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER		
WELL ID	R-09		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: E-LOGS MORE: NAT. GAMMA			OTHER SERVICES SONIC CALIPER TEMP / FLUID COND. DEVIATION
SEC	TWP	RGE	ELEVATION K.B. D.F. G.L.
PERMANENT DATUM	GROUND LEVEL	ABOVE PERM. DATUM	
DATE	12-11-17 / 03-08-18	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	E-LG - GAMMA	VISCOSITY	N/A
DEPTH-DRILLER	1244 FT	LEVEL	FULL
DEPTH-LOGGER	1236 FT	MAX. REC. TEMP.	26.44 DEG C
BTM LOGGED INTERVAL	1236 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	E. TURNER / D. BEAM	TOOL STRING/SN	GEOVISTA E-LOG SN 4035
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	8:00 PM

Tool Summary:					
Date	12-11-17 / 03-08-18	Date	12-11-17 / 03-08-18	Date	12-11-17 / 03-08-18
Run No.	1	Run No.	2	Run No.	3
Tool Model	QL COMBO TOOL	Tool Model	GEOVISTA E-LOG	Tool Model	MSI 60MM SONIC
Tool SN	6292	Tool SN	4035	Tool SN	5050
From	SURFACE	From	SURFACE	From	SURFACE
To	1236 FT	To	1236 FT	To	1236 FT
Recorded By	E. TURNER	Recorded By	E. TURNER	Recorded By	E. TURNER
Truck No	310	Truck No	310	Truck No	310
Operation Check	03-06-18	Operation Check	03-06-18	Operation Check	03-06-18
Calibration Check	03-06-18	Calibration Check	03-06-18	Calibration Check	N/A
Time Logged	9:10 PM	Time Logged	10:00 PM	Time Logged	10:55 PM

Date	12-11-17 / 03-08-18	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	QL DVA	Tool Model		Tool Model	
Tool SN	142201	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1236 FT	To		To	
Recorded By	E. TURNER	Recorded By		Recorded By	
Truck No	310	Truck No		Truck No	
Operation Check	03-06-18	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	11:45 PM	Time Logged		Time Logged	

Additional Comments:

Caliper Arms Used: 15"

Calibration Points: 10" & 21"

E-Log Calibration Range: 1 - 1,000 OHM-M

Calibration Points: 1 & 1,000 OHM-M

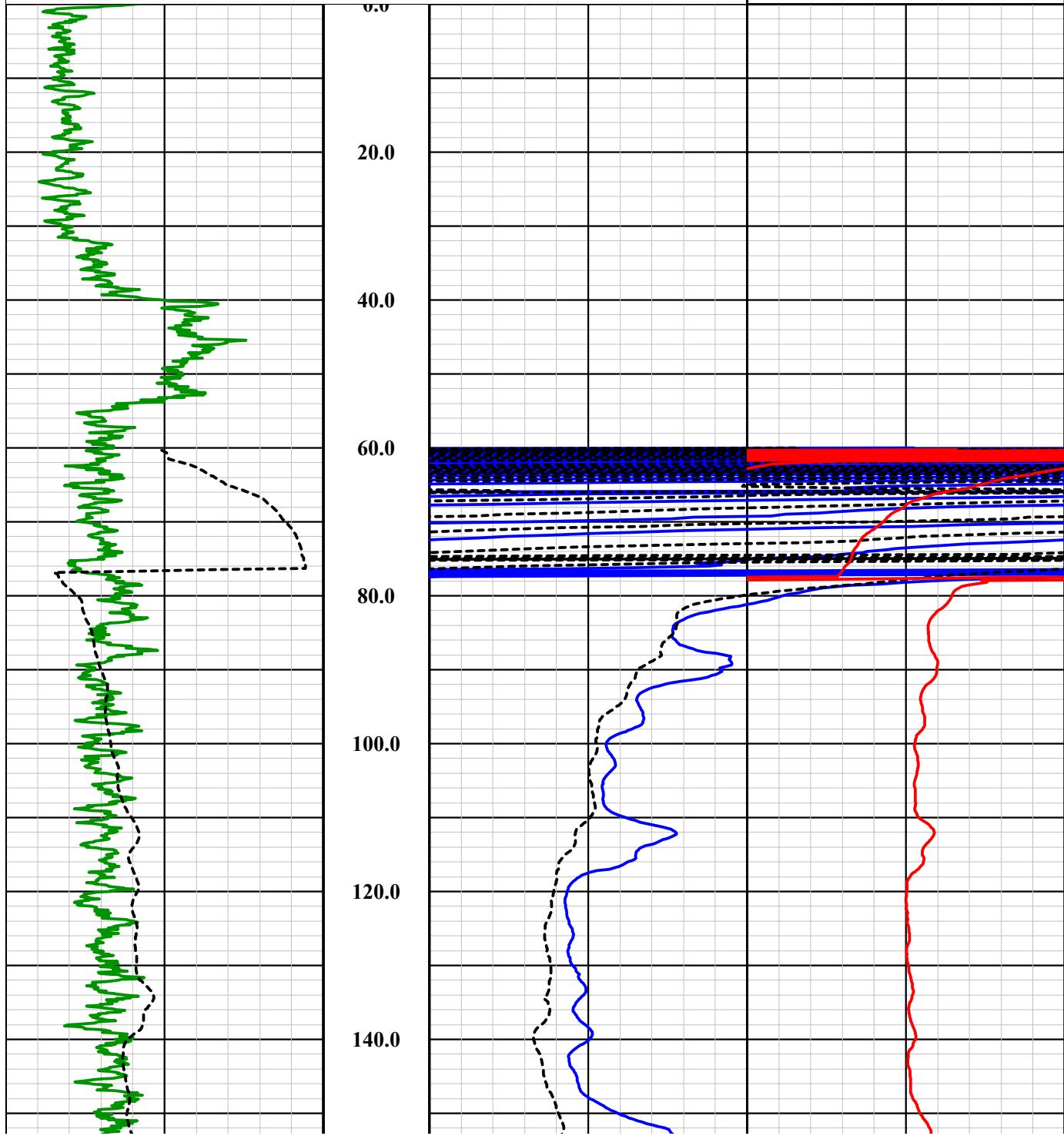
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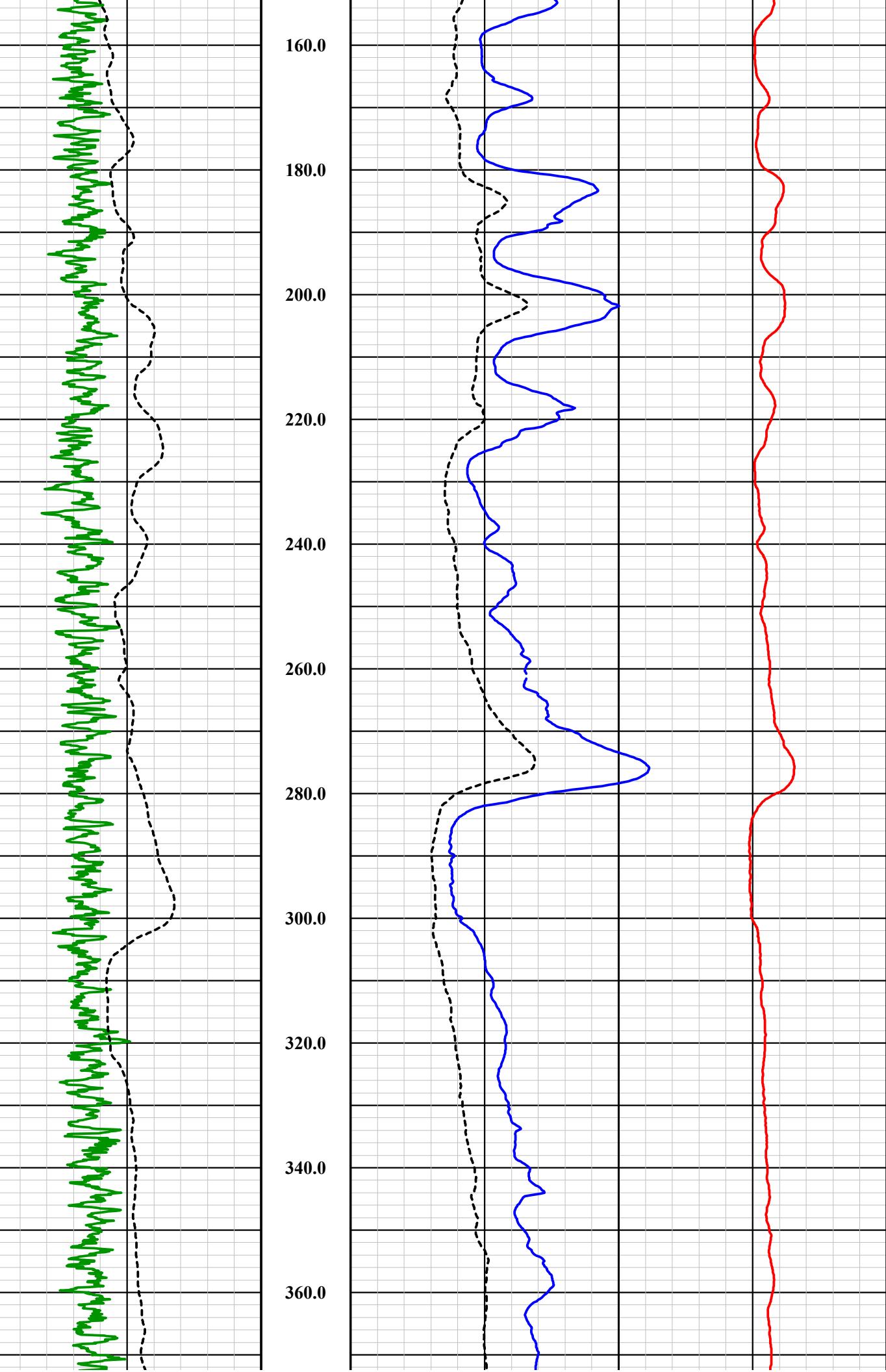
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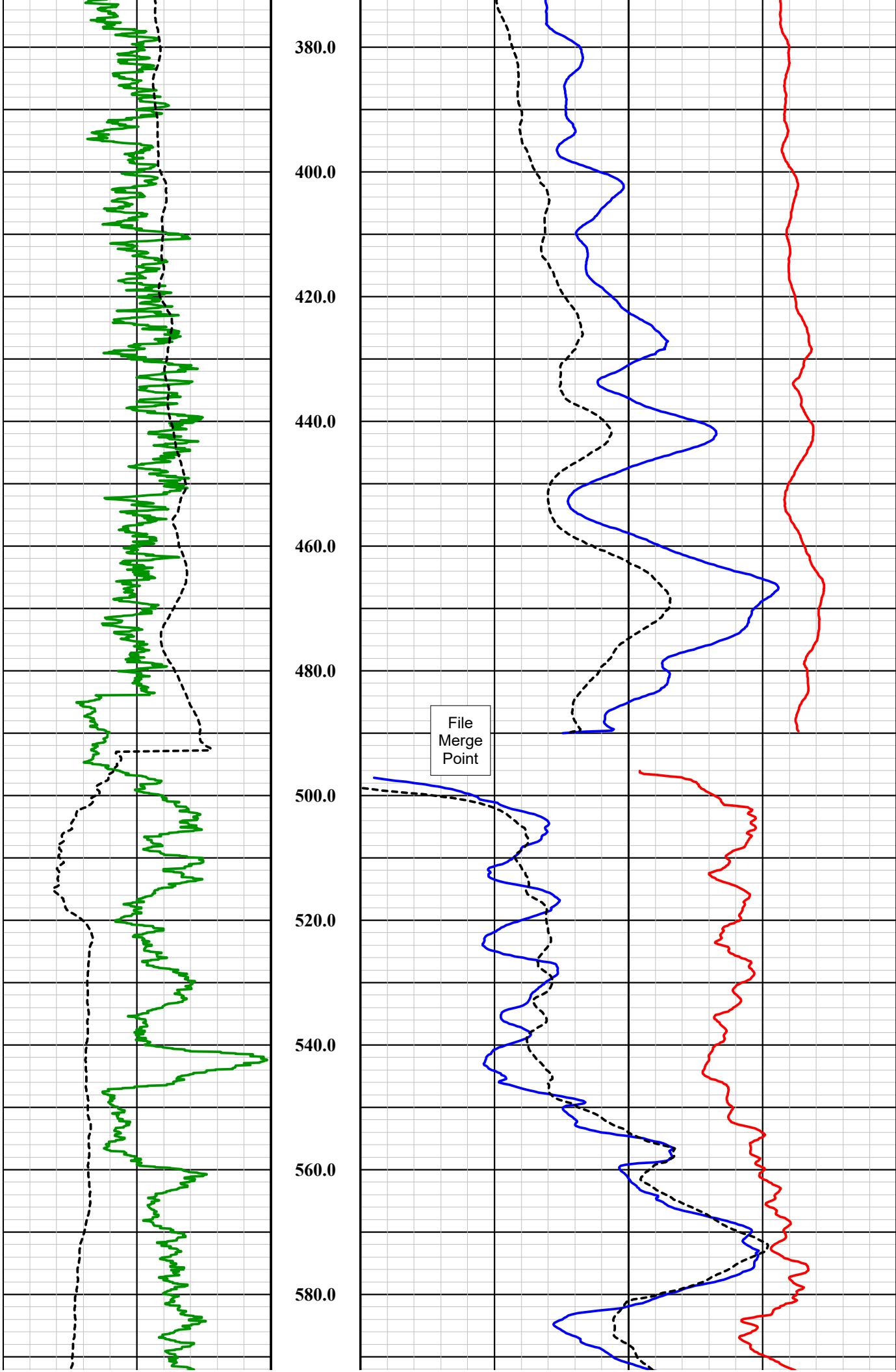
Nat. Gamma		Depth	16" NRes	
0	API	1in:20ft	0	Ohm-m
-200	mV	600	200	

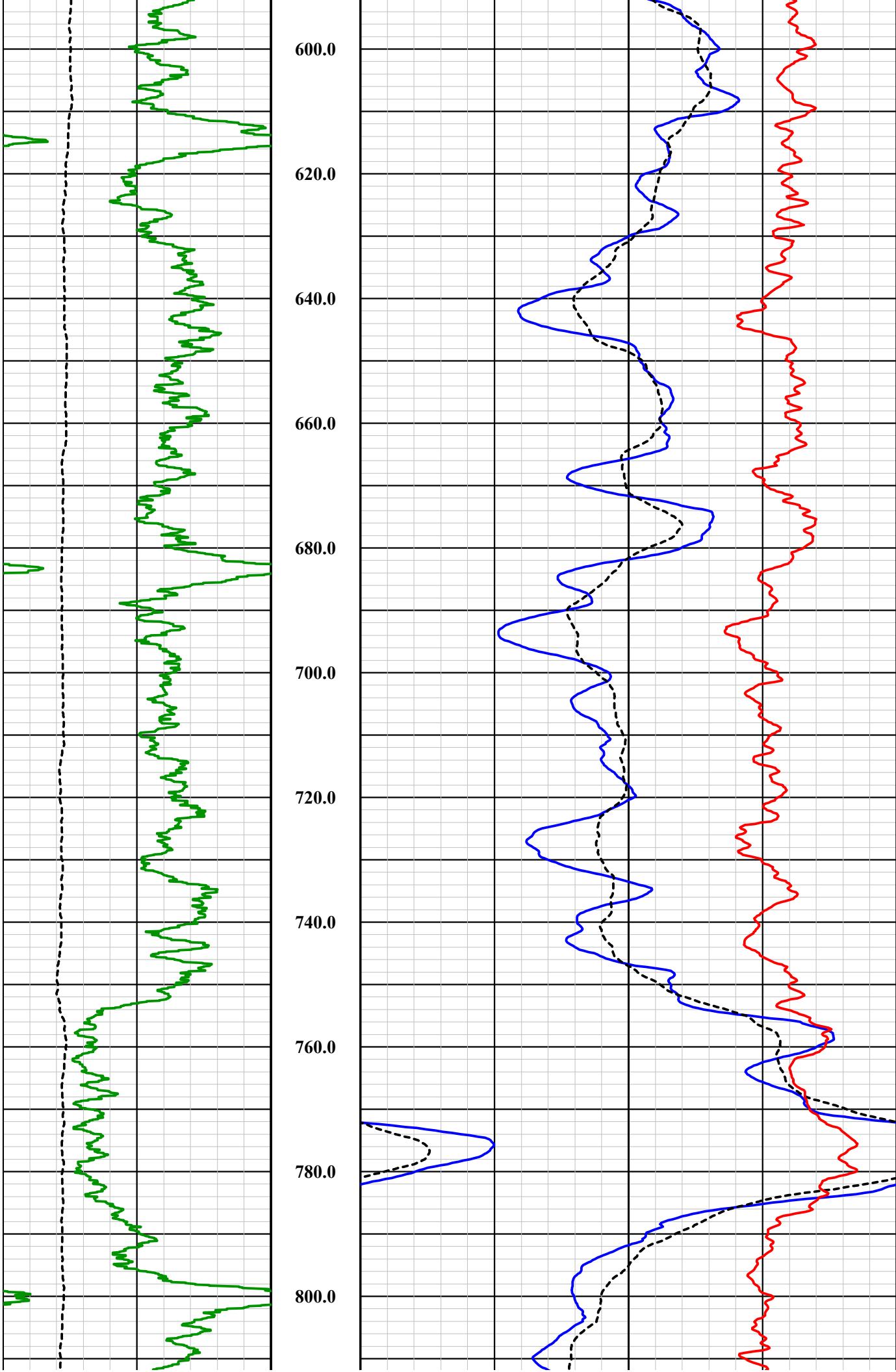
SP		Depth	64" NRes	
-200	mV	600	0	Ohm-m
			200	

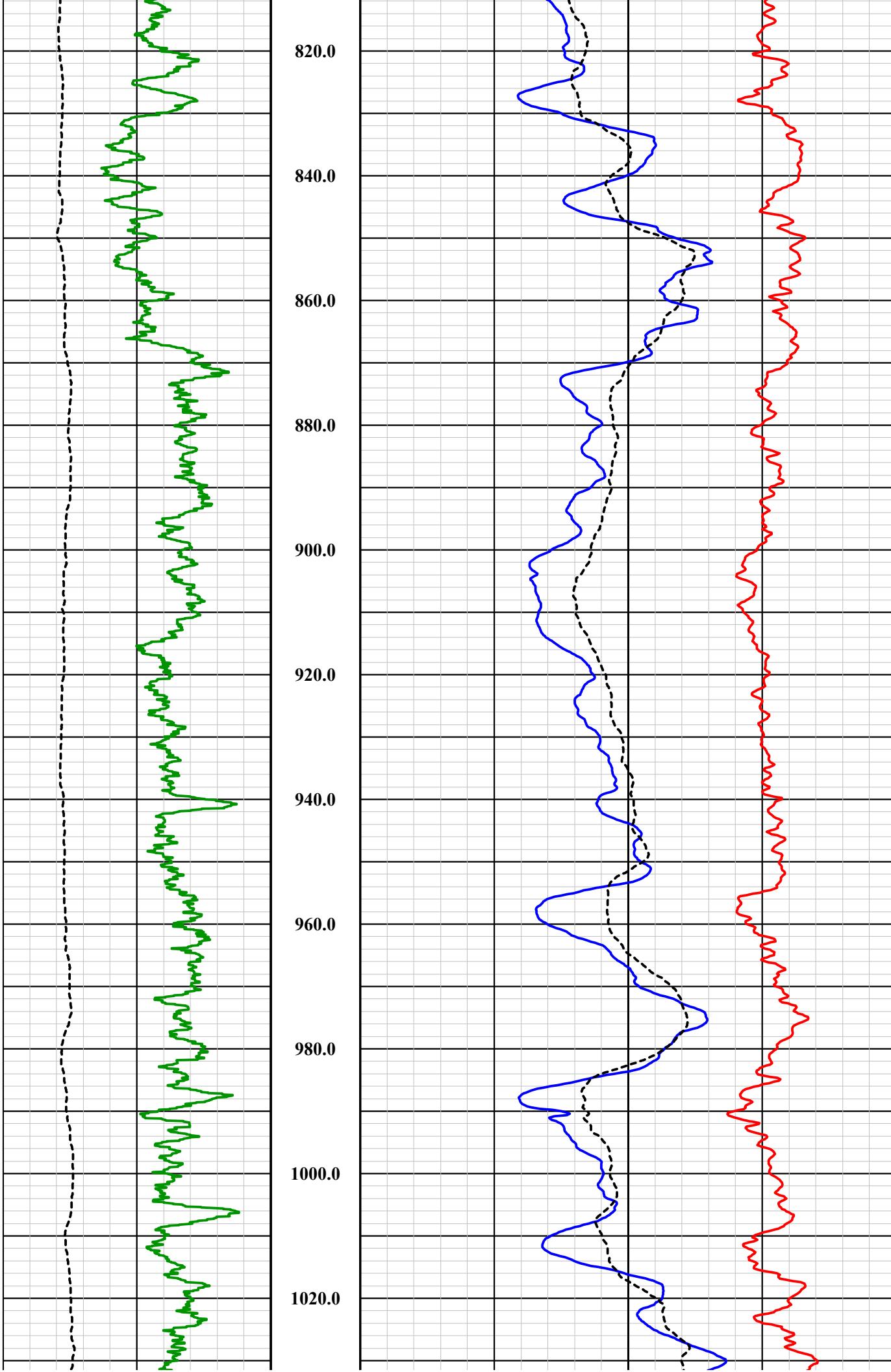
		Depth	SPR	
10	Ohms	50		

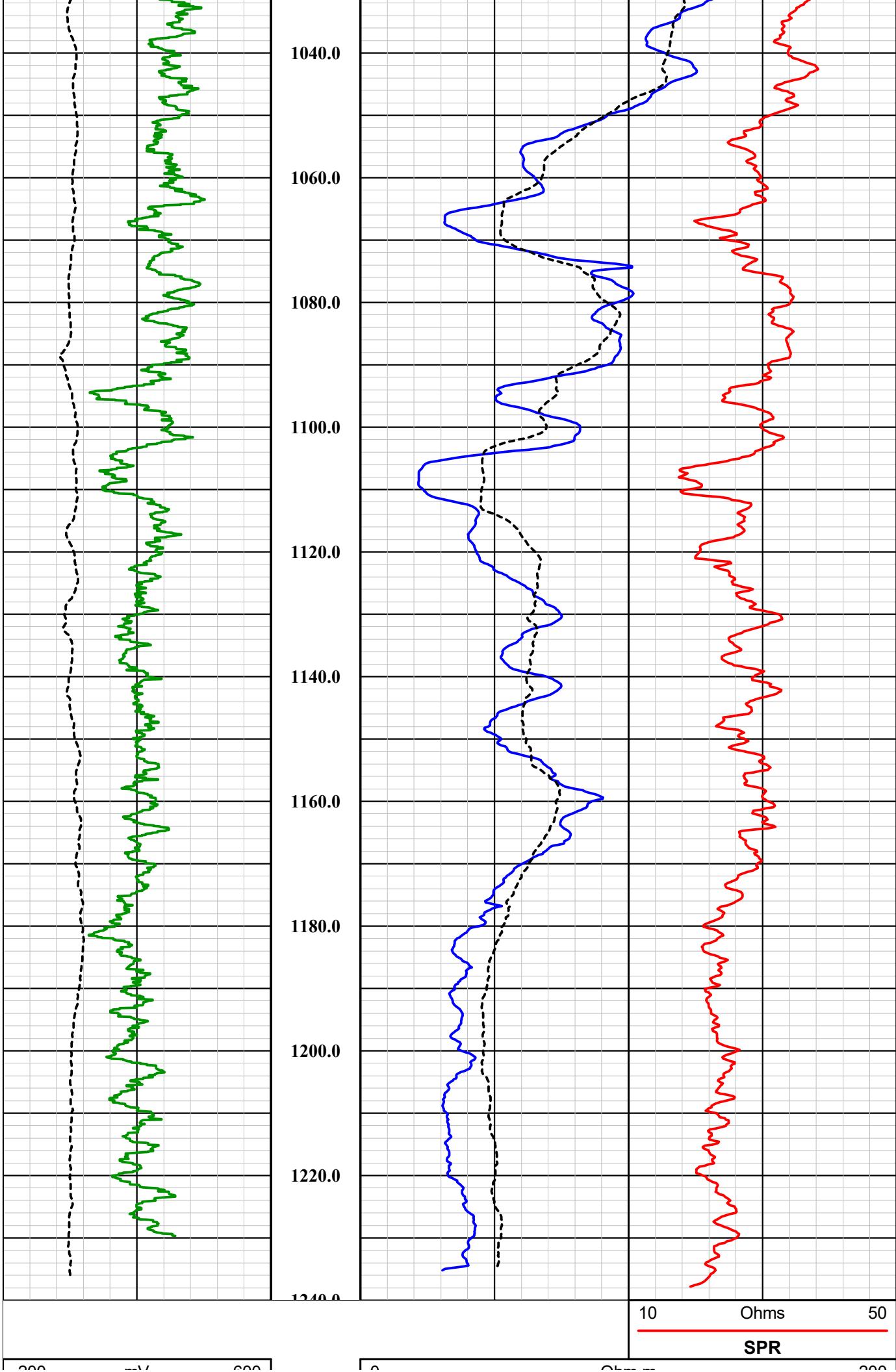












-200	mv	600		0	Ohm-m	200
					64" NRes	
0	API	200	1in:20ft	0	Ohm-m	200
			Depth		16" NRes	

GeoVista E-Log Tool

Probe Top = Depth Ref.

Tool SN: 4035 & 4790



Bridle connects to wireline cablehead: Wireline armor is the B Electrode.

Four Conductor Probe Top

Bridle Electrode (N Electrode)

64" Normal Resistivity Electrode/Spontaneous Potential Electrode (M Electrode)

Probe Length = 2.3 m or 7.55 ft

Bridle Length = 10.0 m or 32.81 ft

Probe Weight = 7.0 kg or 15.4 lbs

Can only be collected in fluid

Isolation Bridle - Not shown in diagram but is necessary for operation

Electrode Measuring Points (from bottom of probe)

Spontaneous Potential (SP): 0.65 m or 2.13 ft

16" Normal Resistivity (16" NRes): 0.50 m or 1.64 ft

64" Normal Resistivity (64" NRes): 1.10 m or 3.61 ft

Single Point Resistance (SPR): 0.25 m or 0.82 ft

Temperature Rating: 80 Deg C (176 Deg F)

Pressure Rating: 200 bar (2900 psi)

16" Normal Resistivity Electrode (M Electrode)

Current Electrode/Single Point Resistance (A Electrode)



1.65" or 42 mm Diameter

QL40 Gamma-Caliper-Temperature-Fluid Conductivity

Probe Top = Depth Ref.

Tool SN: 5613, 5979, 6161 & 6292

Four Conductor MSI Probe Top

Probe Length = 3.69 m or 12.12 ft

Probe Weight = 18.195 kg or 40.11 lbs

Caliper arms can only collect data logging up hole

Fluid Temperature/Conductivity and Natural Gamma
can be collected logging up and down hole

Temperature Rating: 80 Deg C (176 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 1.07 m (42.12 in)

3-Arm Caliper = 1.78 m (70.27 in)

Available Arm Sizes: 3", 9", and 15"



FTC (Fluid Temperature/Conductivity) = 0.78 m (30.71 in)

1.57" or 40.0 mm Diameter



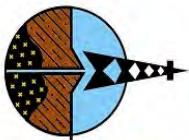
**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	R-09
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final

E-Log Summary



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER		
WELL ID	R-09		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: GAMMA - CALIPER MORE: TEMP / FLUID COND. LOCATION			
SEC	TWP	RGE	ELEVATION
PERMANENT DATUM	GROUND LEVEL	ABOVE PERM. DATUM	K.B.
LOG MEAS. FROM			D.F.
DRILLING MEAS. FROM GROUND LEVEL			G.L.
DATE	12-11-17 / 03-08-18	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	GAMMA-CALIPER-FTC	VISCOSITY	N/A
DEPTH-DRILLER	1244 FT	LEVEL	FULL
DEPTH-LOGGER	1236 FT	MAX. REC. TEMP.	26.44 DEG C
BTM LOGGED INTERVAL	1236 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	HYDRO-RESOURCES	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	E. TURNER / D. BEAM	TOOL STRING/SN	QL COMBO TOOL SN 6292
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	8:00 PM
RUN	BOREHOLE RECORD		CASING RECORD
NO.	BIT	FROM	TO
1	? IN	SURFACE	40 FT
2	22 IN	40 FT	TOTAL DEPTH
3	14.75 IN	495 FT	TOTAL DEPTH
COMMENTS:			

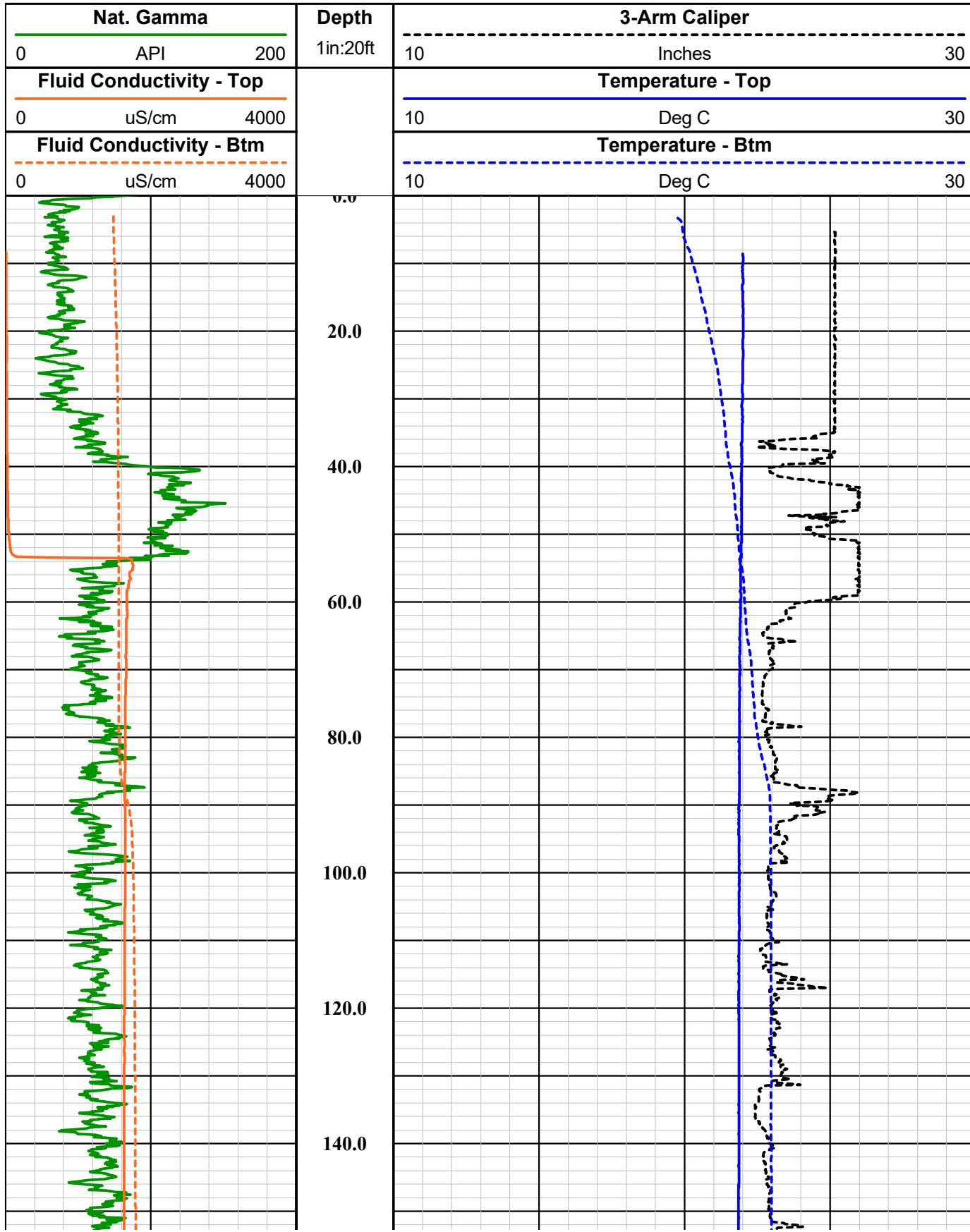
Tool Summary:					
Date	12-11-17 / 03-08-18	Date	12-11-17 / 03-08-18	Date	12-11-17 / 03-08-18
Run No.	1	Run No.	2	Run No.	3
Tool Model	QL COMBO TOOL	Tool Model	GEOVISTA E-LOG	Tool Model	MSI 60MM SONIC
Tool SN	6292	Tool SN	4035	Tool SN	5050
From	SURFACE	From	SURFACE	From	SURFACE
To	1236 FT	To	1236 FT	To	1236 FT
Recorded By	E. TURNER	Recorded By	E. TURNER	Recorded By	E. TURNER
Truck No	310	Truck No	310	Truck No	310
Operation Check	03-06-18	Operation Check	03-06-18	Operation Check	03-06-18
Calibration Check	03-06-18	Calibration Check	03-06-18	Calibration Check	N/A
Time Logged	9:10 PM	Time Logged	10:00 PM	Time Logged	10:55 PM

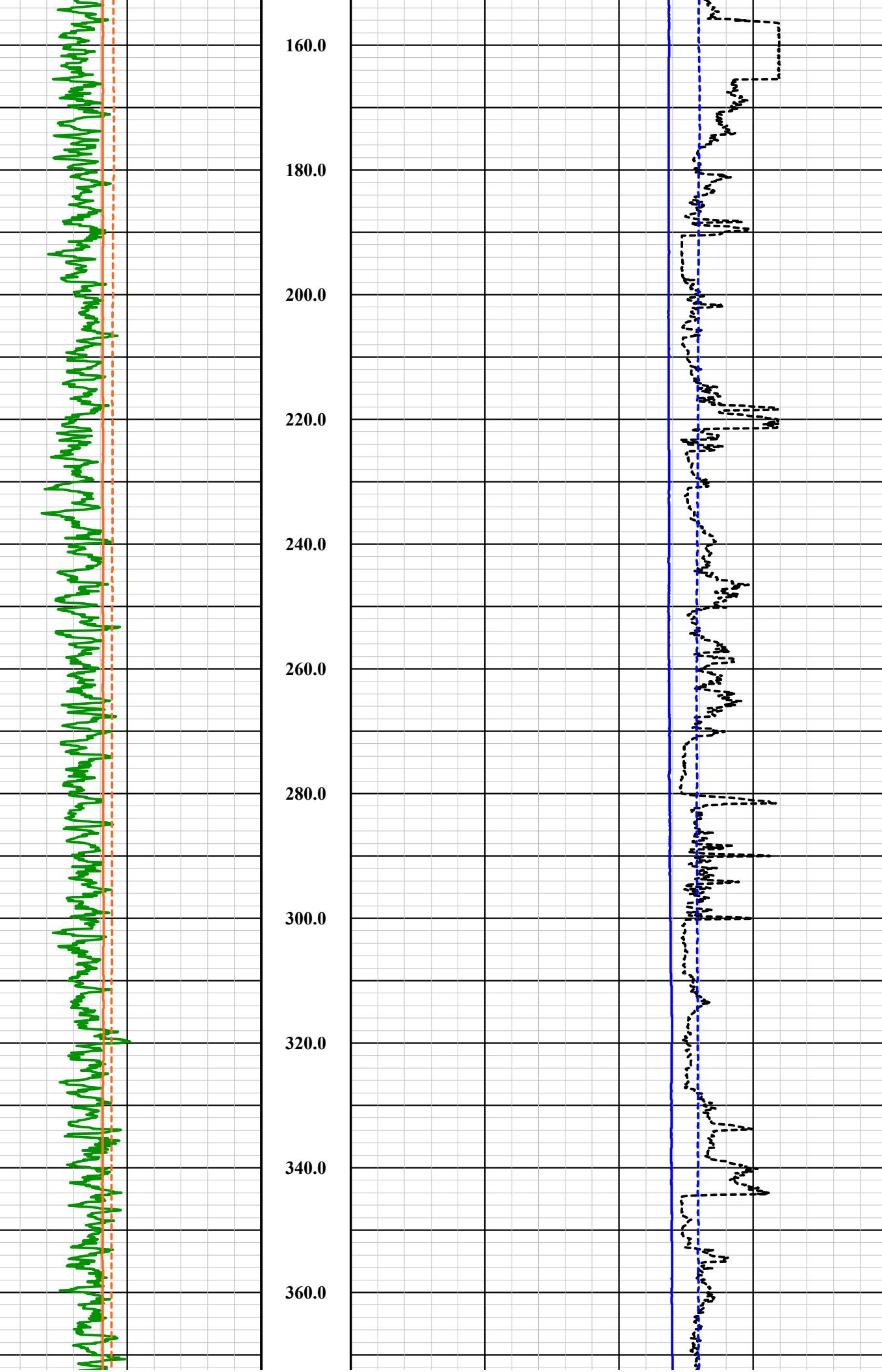
Tool Summary:					
Date	12-11-17 / 03-08-18	Date	12-11-17 / 03-08-18	Date	12-11-17 / 03-08-18
Run No.	4	Run No.	5	Run No.	6
Tool Model	QL DVA	Tool Model		Tool Model	
Tool SN	142201	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1236 FT	To		To	
Recorded By	E. TURNER	Recorded By		Recorded By	
Truck No	310	Truck No		Truck No	
Operation Check	03-06-18	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	11:45 PM	Time Logged		Time Logged	

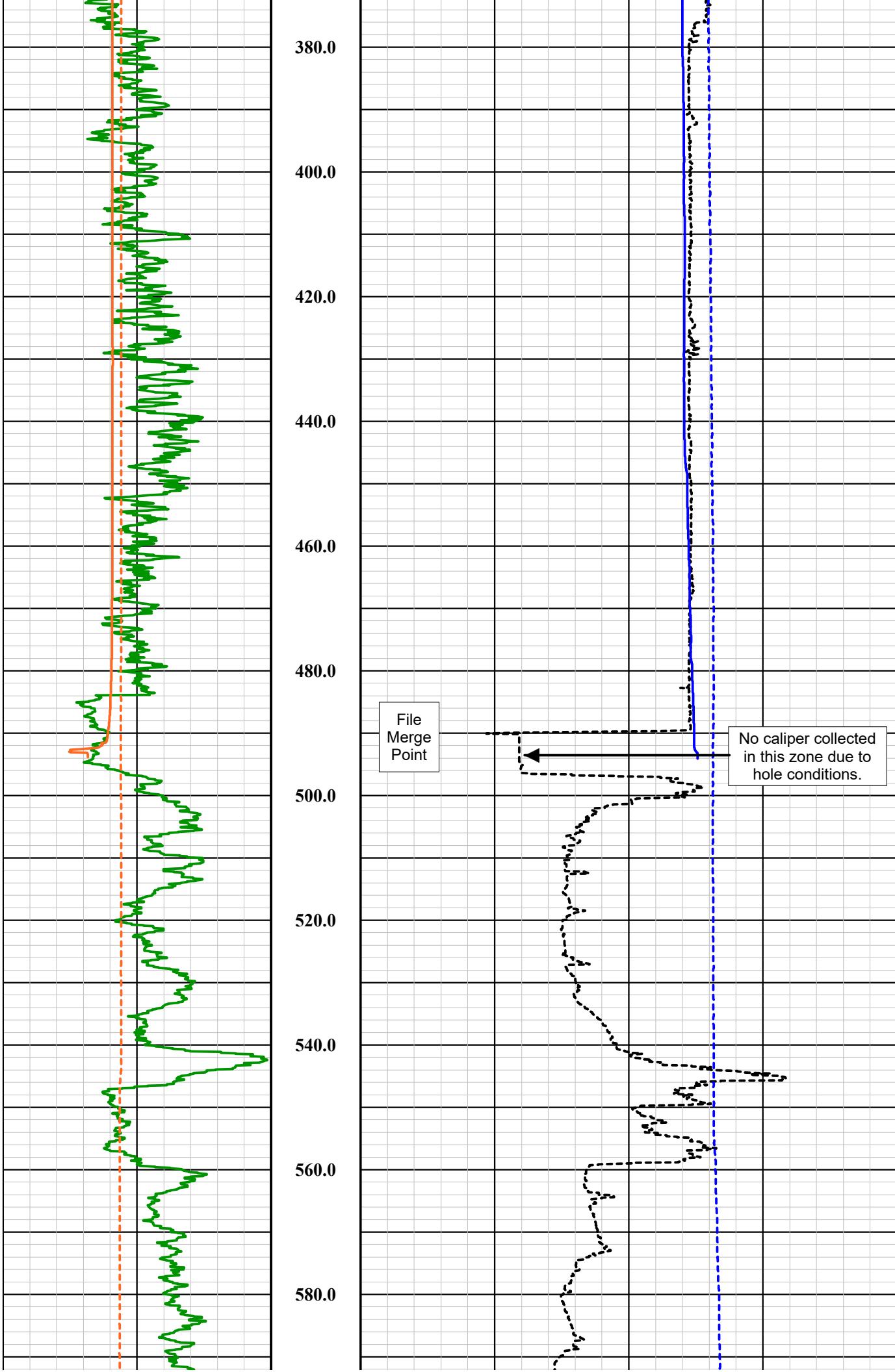
Additional Comments:
 Caliper Arms Used: 15"
 Calibration Points: 10" & 21"

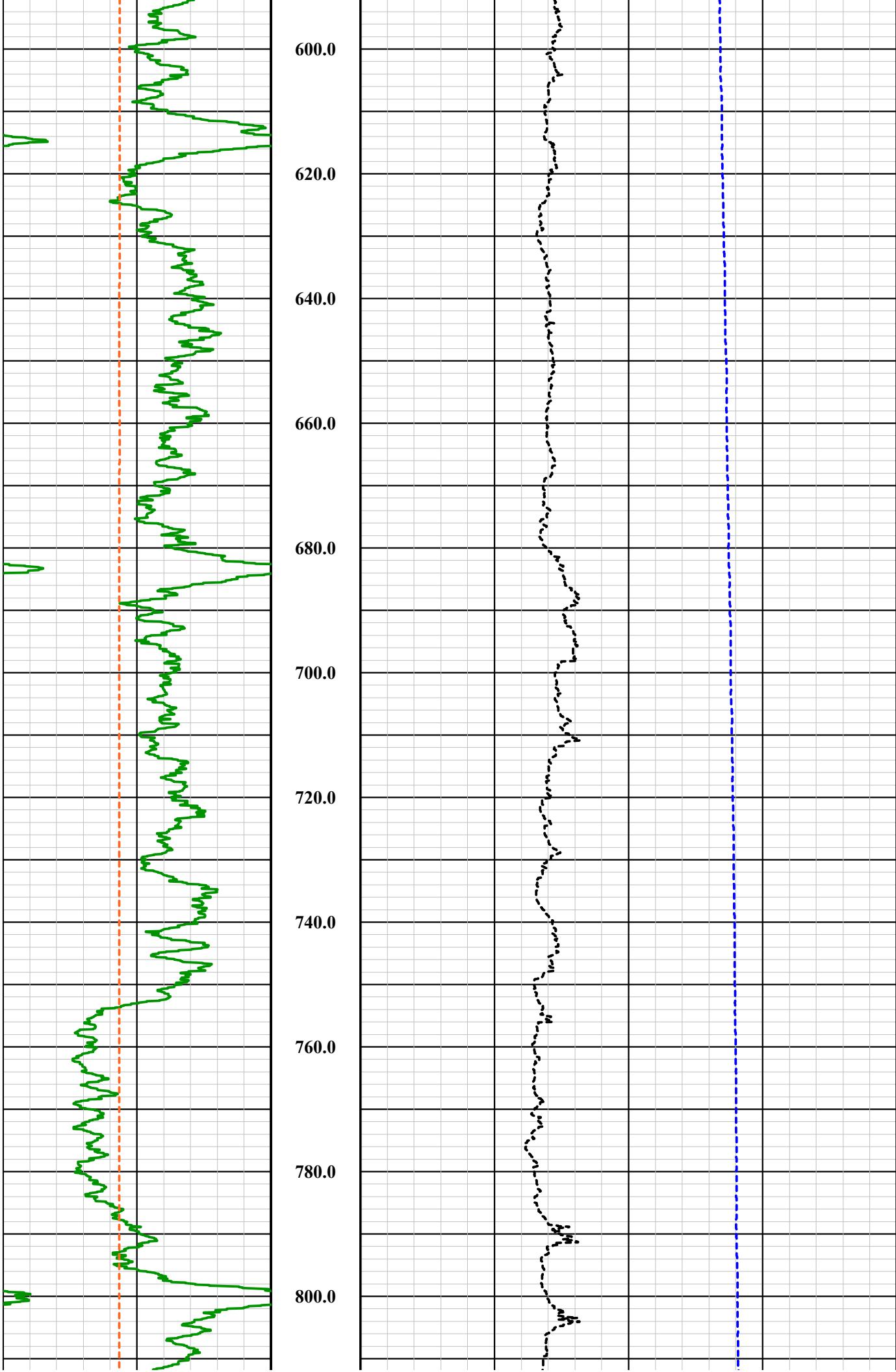
Disclaimer:

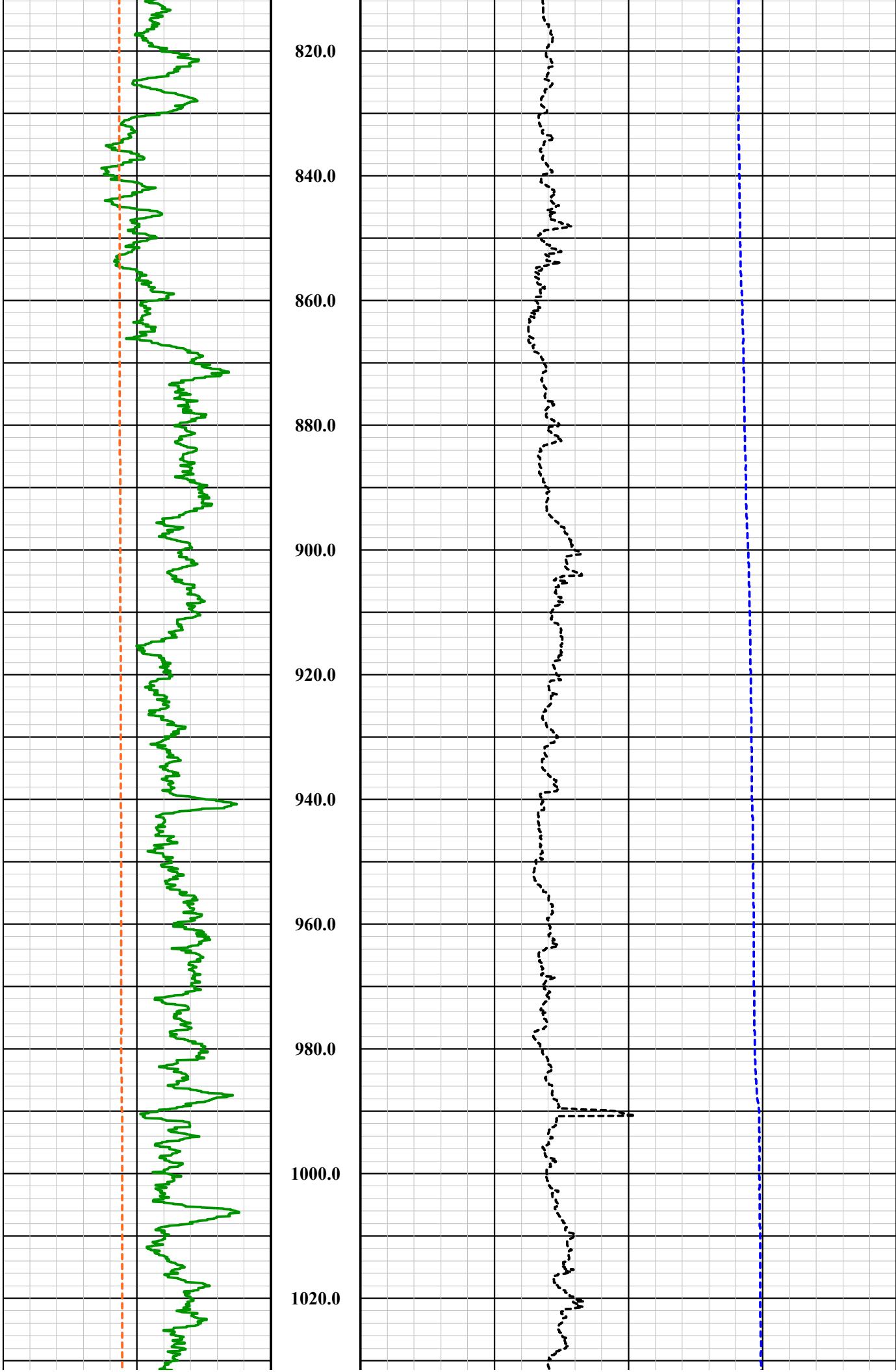
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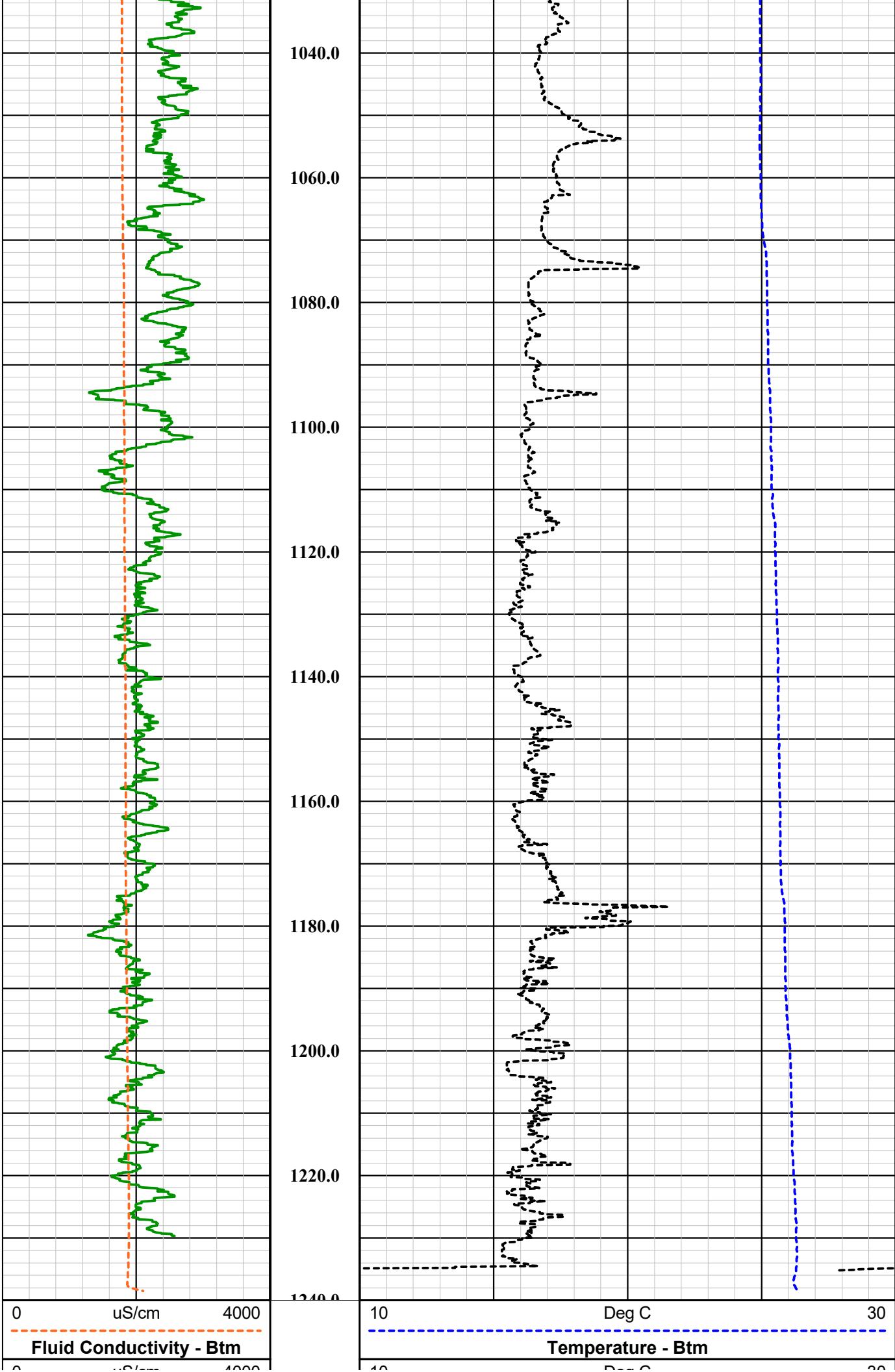












0 $\mu\text{S}/\text{cm}$ 4000

Fluid Conductivity - Btm

10

Deg C

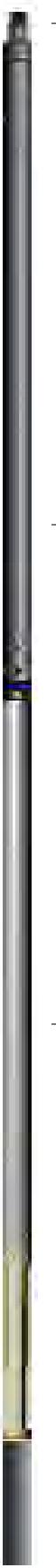
30

0	uS/cm	4000	10	Deg C	30
Fluid Conductivity - Top		Temperature - Top			
0	API	200	1in:20ft	10	Inches
Nat. Gamma		Depth	3-Arm Caliper		

QL40 Gamma-Caliper-Temperature-Fluid Conductivity

Probe Top = Depth Ref.

Tool SN: 5613, 5979, 6161 & 6292



Four Conductor MSI Probe Top

Probe Length = 3.69 m or 12.12 ft

Probe Weight = 18.195 kg or 40.11 lbs

Caliper arms can only collect data logging up hole

Fluid Temperature/Conductivity and Natural Gamma
can be collected logging up and down hole

Temperature Rating: 80 Deg C (176 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 1.07 m (42.12 in)

3-Arm Caliper = 1.78 m (70.27 in)

Available Arm Sizes: 3", 9", and 15"

1.57" or 40.0 mm Diameter



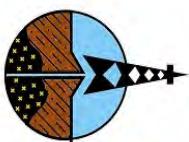
**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	R-09
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final

GCFTC Summary



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER		
WELL ID	R-09		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: 60MM SONIC MORE: GAMMA - CALIPER			OTHER SERVICES TEMP / FLUID COND E-LOG DEVIATION
SEC	TWP	RGE	ELEVATION K.B. D.F. G.L.
PERMANENT DATUM	GROUND LEVEL	ABOVE PERM. DATUM	
DATE	12-11-17 / 03-08-18	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	SONIC-GAMMA-CALIPER	VISCOSITY	N/A
DEPTH-DRILLER	1244 FT	LEVEL	FULL
DEPTH-LOGGER	1236 FT	MAX. REC. TEMP.	26.44 DEG C
BTM LOGGED INTERVAL	1236 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	HYDRO-RESOURCES	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	E. TURNER / D. BEAM	TOOL STRING/SN	MSI 60MM SONIC SN 5050
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	8:00 PM

Tool Summary:					
Date	12-11-17 / 03-08-18	Date	12-11-17 / 03-08-18	Date	12-11-17 / 03-08-18
Run No.	1	Run No.	2	Run No.	3
Tool Model	QL COMBO TOOL	Tool Model	GEOVISTA E-LOG	Tool Model	MSI 60MM SONIC
Tool SN	6292	Tool SN	4035	Tool SN	5050
From	SURFACE	From	SURFACE	From	SURFACE
To	1236 FT	To	1236 FT	To	1236 FT
Recorded By	E. TURNER	Recorded By	E. TURNER	Recorded By	E. TURNER
Truck No	310	Truck No	310	Truck No	310
Operation Check	03-06-18	Operation Check	03-06-18	Operation Check	03-06-18
Calibration Check	03-06-18	Calibration Check	03-06-18	Calibration Check	N/A
Time Logged	9:10 PM	Time Logged	10:00 PM	Time Logged	10:55 PM

Date	12-11-17 / 03-08-18	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	QL DVA	Tool Model		Tool Model	
Tool SN	142201	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1236 FT	To		To	
Recorded By	E. TURNER	Recorded By		Recorded By	
Truck No	310	Truck No		Truck No	
Operation Check	03-06-18	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	11:45 PM	Time Logged		Time Logged	

Additional Comments:

Caliper Arms Used: 15"

Calibration Points: 10" & 21"

E-Log Calibration Range: 1 - 1,000 OHM-M

Calibration Points: 1 & 1,000 OHM-M

Disclaimer:

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Nat. Gamma	Depth	RX1 - VDL	RX2 - VDL
0 API 200	1in:20ft	100 uSec 1000	100 uSec 1000

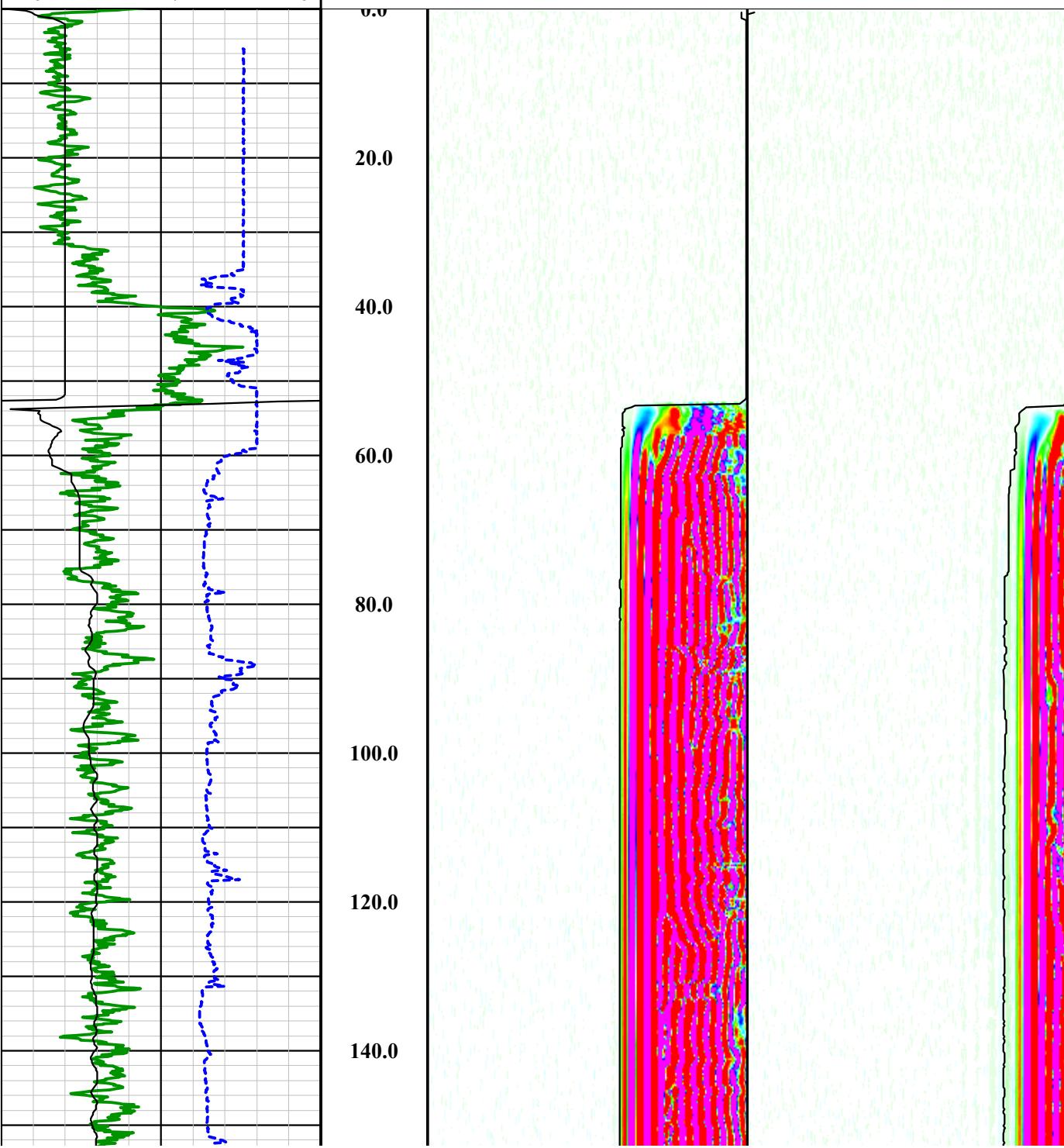
3-Arm Caliper

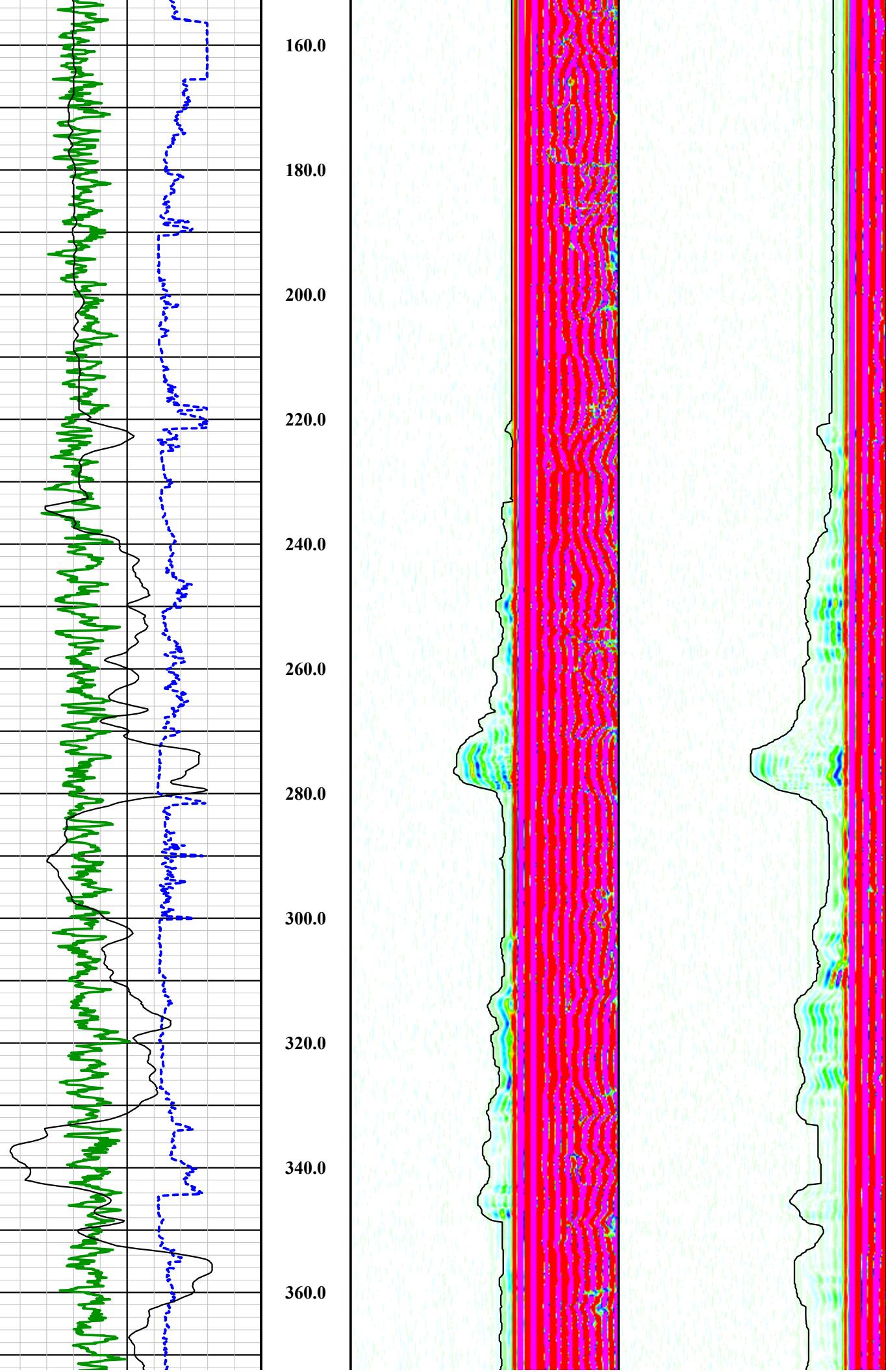
10 Inches 30

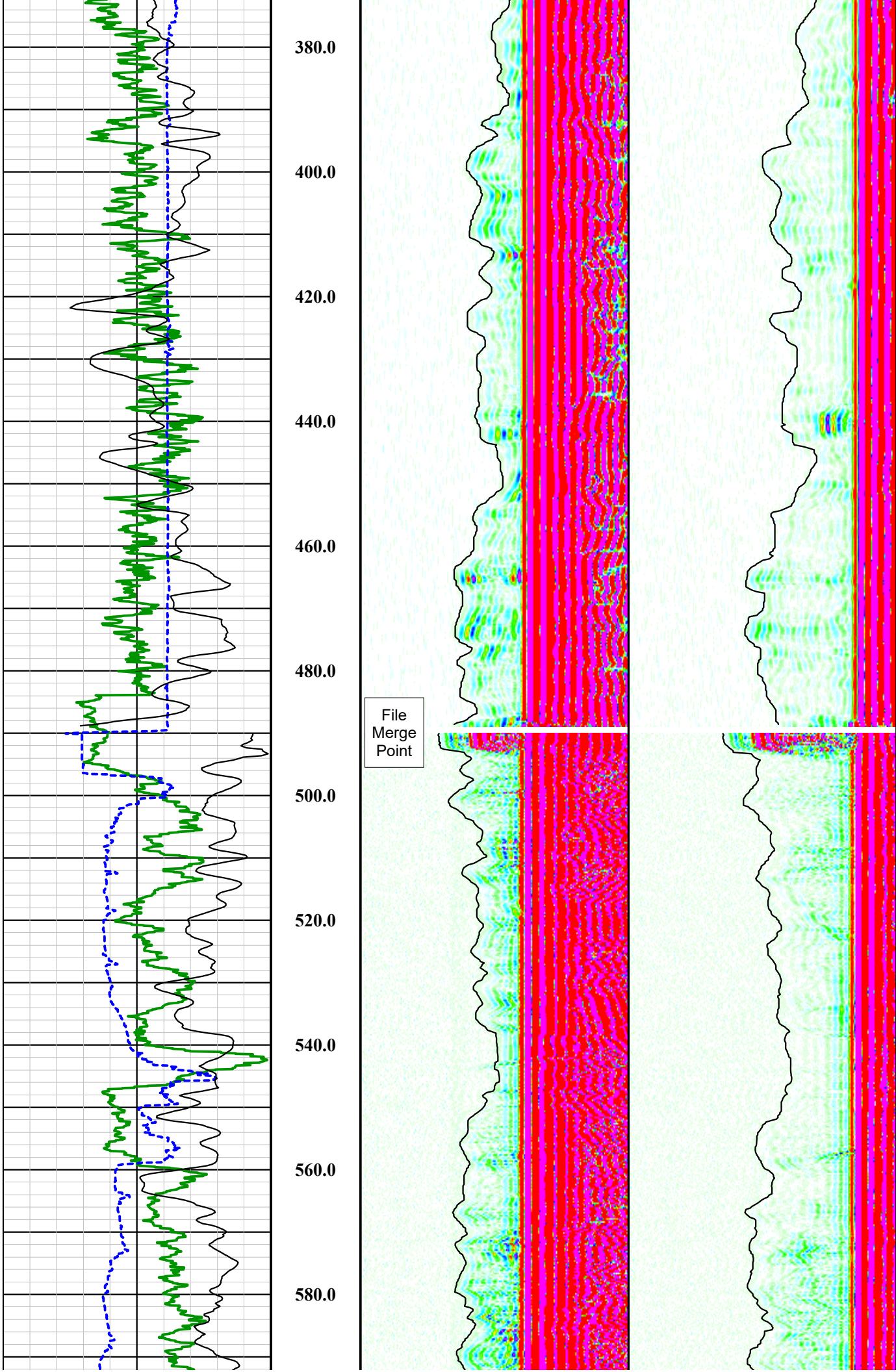
Delta T

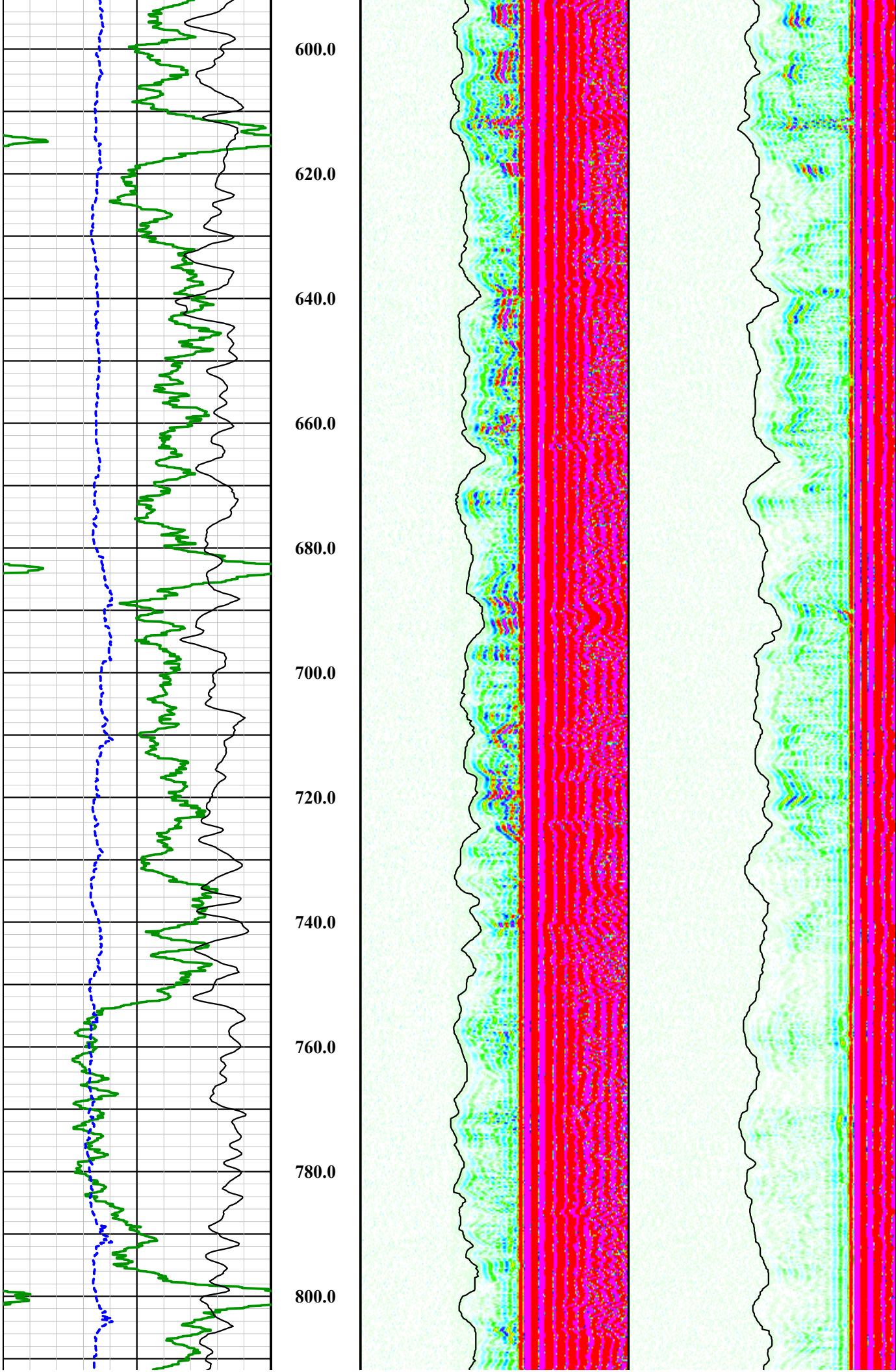
240 uSec/ft 40

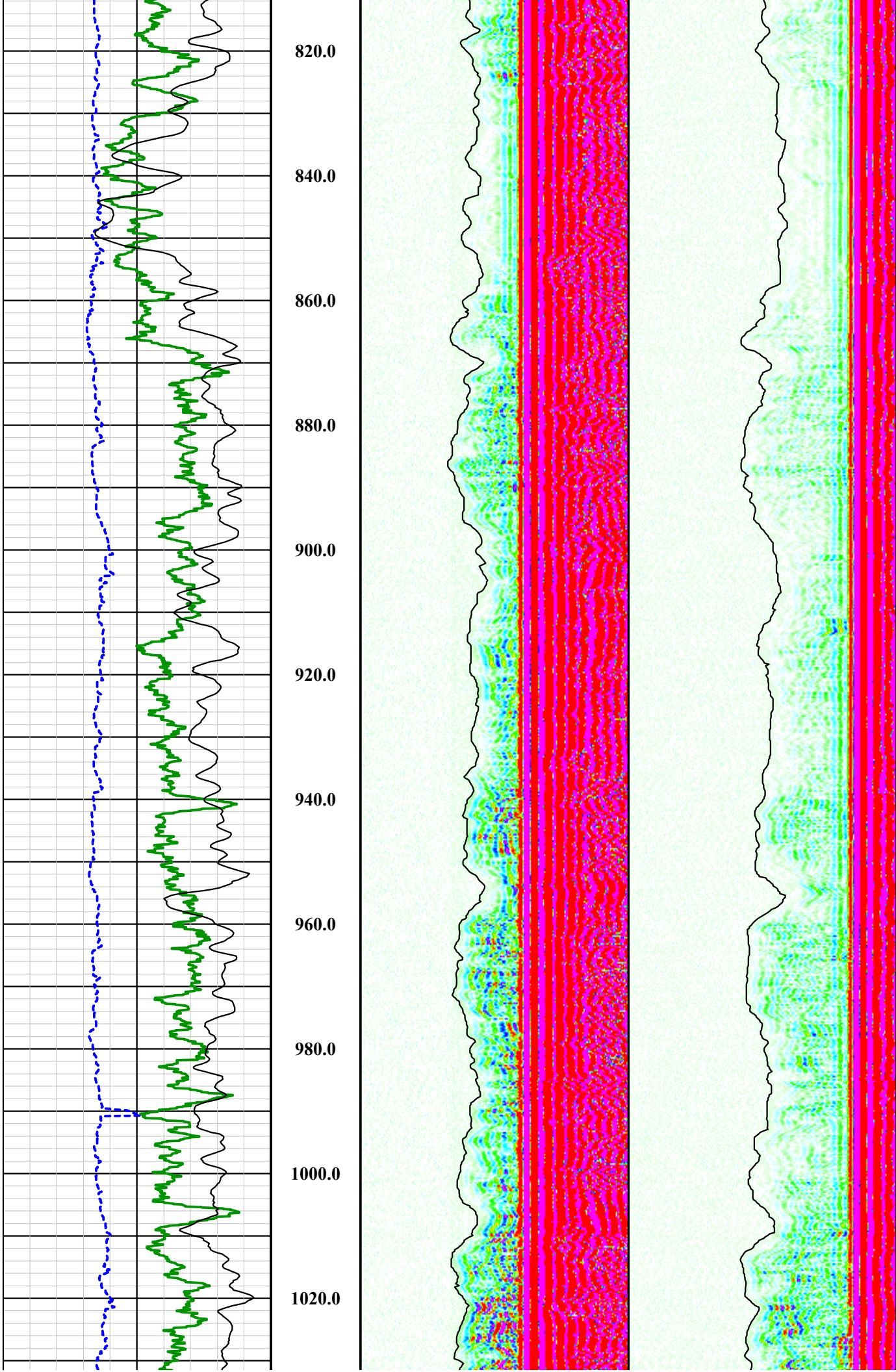
RX1 - Travel Time	RX2 - Travel Time
100 uSec 1000	100 uSec 1000

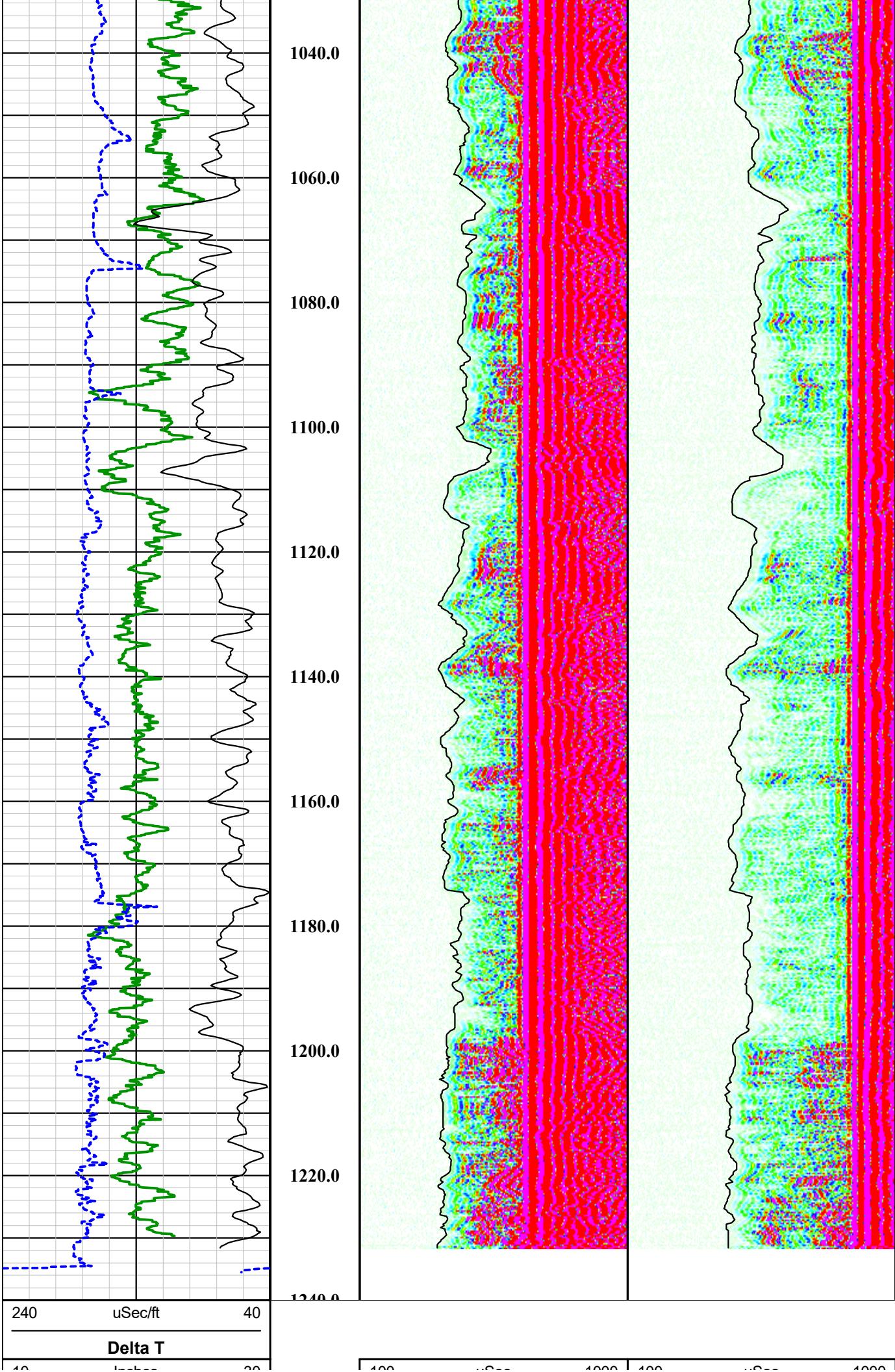


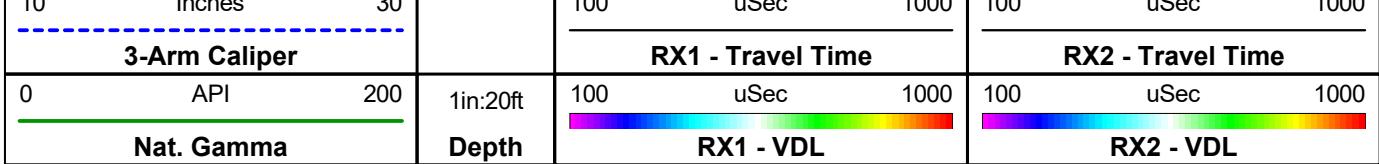








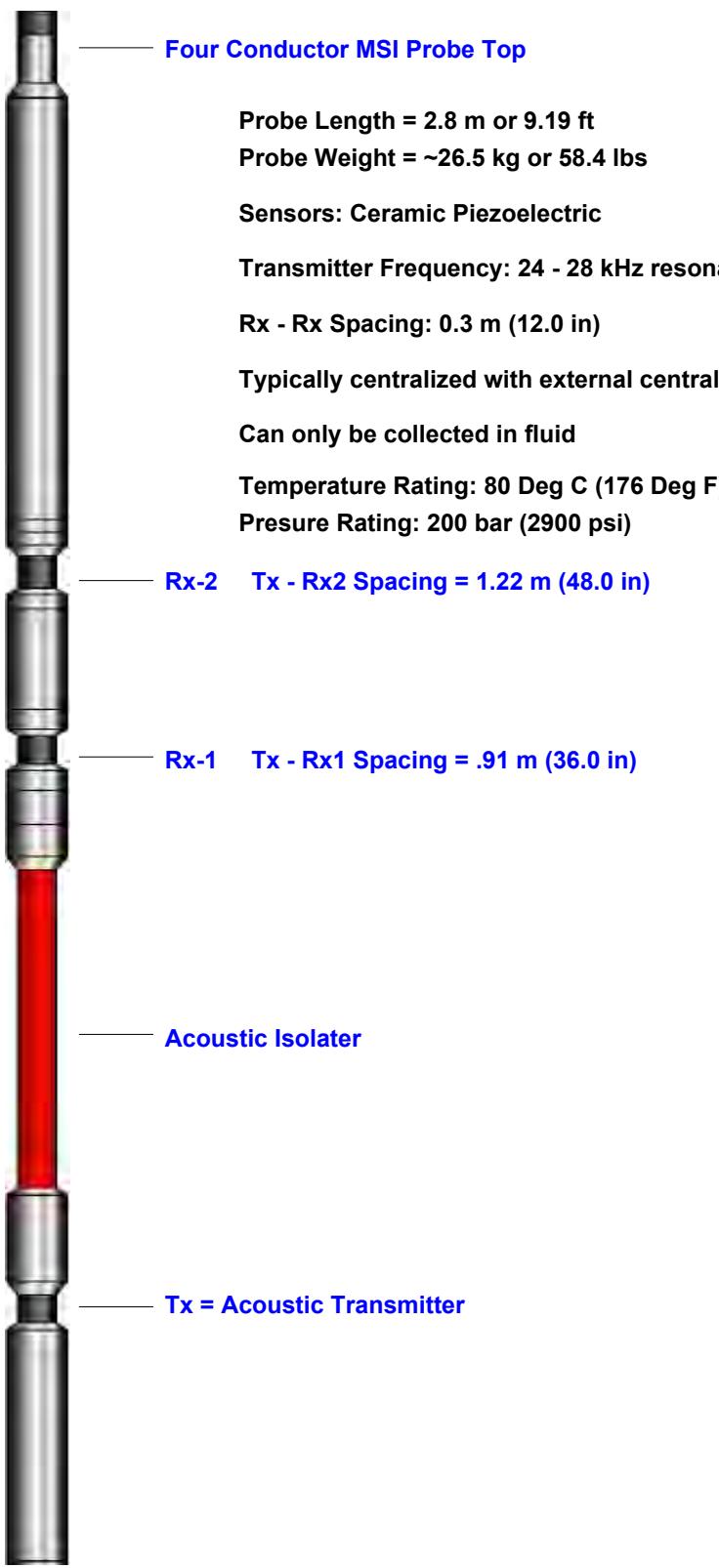




MSI 60 mm 2 RX Full Waveform Sonic Tool

Probe Top = Depth Ref.

Tool SN: 5001, 5050 & 6003





0.660 m or 26.0 in. - End of tool to center of Tx

2.36 in or 60 mm Diameter

QL40 Gamma-Caliper-Temperature-Fluid Conductivity

Probe Top = Depth Ref.

Tool SN: 5613, 5979, 6161 & 6292

Four Conductor MSI Probe Top

Probe Length = 3.69 m or 12.12 ft

Probe Weight = 18.195 kg or 40.11 lbs

Caliper arms can only collect data logging up hole

Fluid Temperature/Conductivity and Natural Gamma
can be collected logging up and down hole

Temperature Rating: 80 Deg C (176 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 1.07 m (42.12 in)

3-Arm Caliper = 1.78 m (70.27 in)

Available Arm Sizes: 3", 9", and 15"



FTC (Fluid Temperature/Conductivity) = 0.78 m (30.71 in)

1.57" or 40.0 mm Diameter

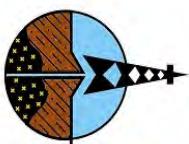


**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	R-09
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final Sonic Summary



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER		
WELL ID	R-09		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: 3-ARM CALIPER MORE: W/ VOLUME CALC.			OTHER SERVICES SONIC E-LOG DEVIATION
LOCATION	SEC	TWP	RGE
PERMANENT DATUM	ELEVATION		
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	
DRILLING MEAS. FROM	GROUND LEVEL		
DATE	12-11-17	TYPE FLUID IN HOLE	K.B.
RUN No	1	MUD WEIGHT	D.F.
TYPE LOG	VOLUME CALCULATION	VISCOSITY	G.L.
DEPTH-DRILLER	500.0 FT	LEVEL	
DEPTH-LOGGER	494.0 FT	MAX. REC. TEMP.	MUD
BTM LOGGED INTERVAL	494.0 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	~53.5 FT
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	0.1 FT
RECORDED BY / Logging Eng.	E. BEAM / K. MITCHELL	TOOL STRING/SN	TRUCK #310
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	QL COMBO TOOL SN 6292
RUN	BOREHOLE RECORD		CASING RECORD
NO.	BIT	FROM	TO
1	? IN	SURFACE	40 FT
2	22 IN	TOTAL DEPTH	26 IN STEEL SURFACE 40 FT
3			
COMMENTS:			

Tool Summary:					
Date	12-11-17	Date	12-11-17	Date	12-11-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	QL COMBO TOOL	Tool Model	MSI 2 RX SONIC	Tool Model	QL DEVIATION
Tool SN	6292	Tool SN	5050	Tool SN	142201
From	SURFACE	From	SURFACE	From	SURFACE
To	494.0 FT	To	494.0 FT	To	SURFACE
Recorded By	E. BEAM	Recorded By	E. BEAM	Recorded By	494.0 FT
Truck No	310	Truck No	310	Truck No	310
Operation Check	12-10-17	Operation Check	12-11-17	Operation Check	12-11-17
Calibration Check	12-10-17	Calibration Check	N/A	Calibration Check	N/A
Time Logged	4:30 PM	Time Logged	5:00 PM	Time Logged	5:45 PM

Date	12-11-17	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	GEOVISTA E-LOG	Tool Model		Tool Model	
Tool SN	4035	Tool SN		Tool SN	
From	SURFACE	From		From	
To	494.0 FT	To		To	
Recorded By	E. BEAM	Recorded By		Recorded By	
Truck No	310	Truck No		Truck No	
Operation Check	12-11-17	Operation Check		Operation Check	
Calibration Check	12-06-17	Calibration Check		Calibration Check	
Time Logged	6:30 PM	Time Logged		Time Logged	

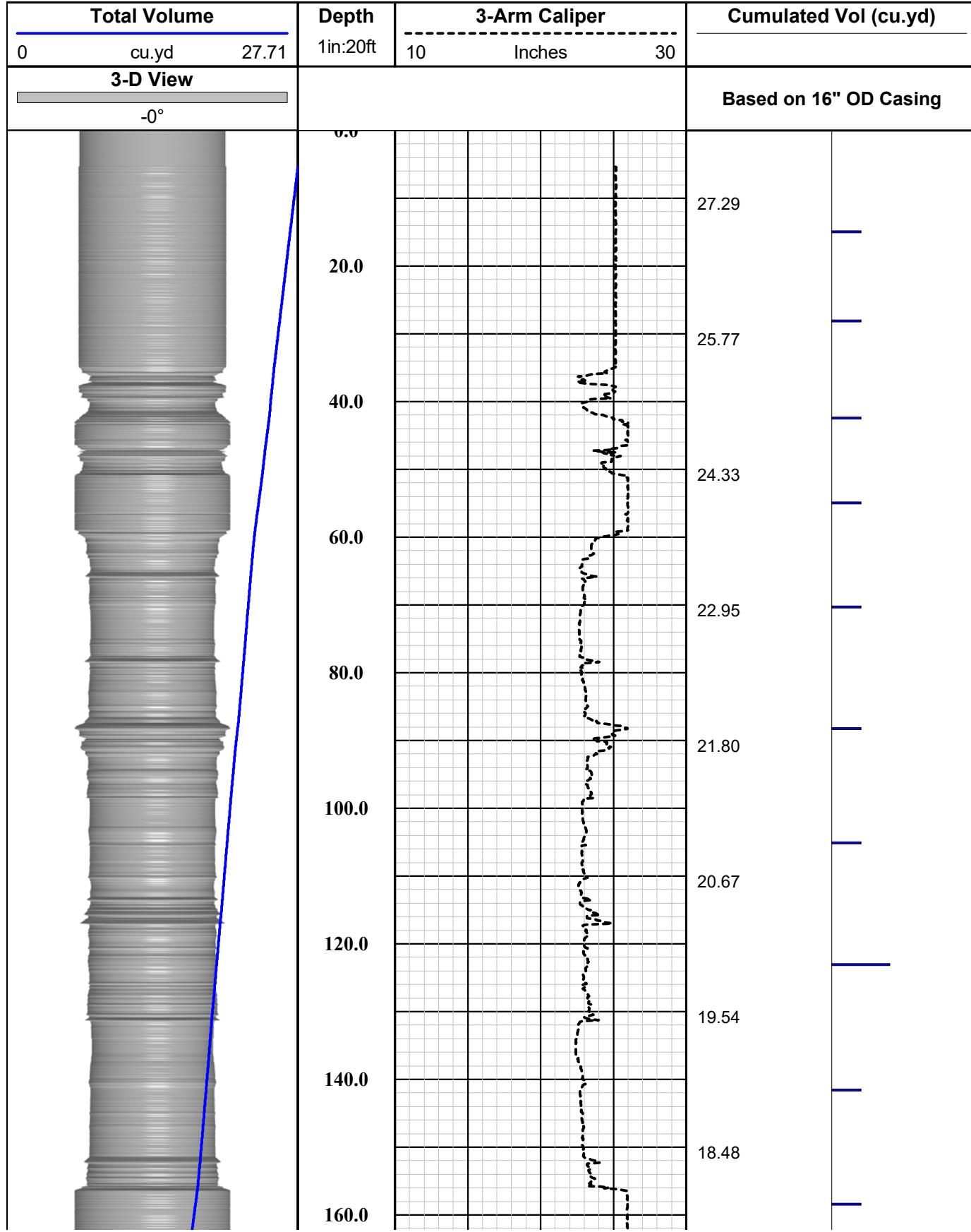
Additional Comments:

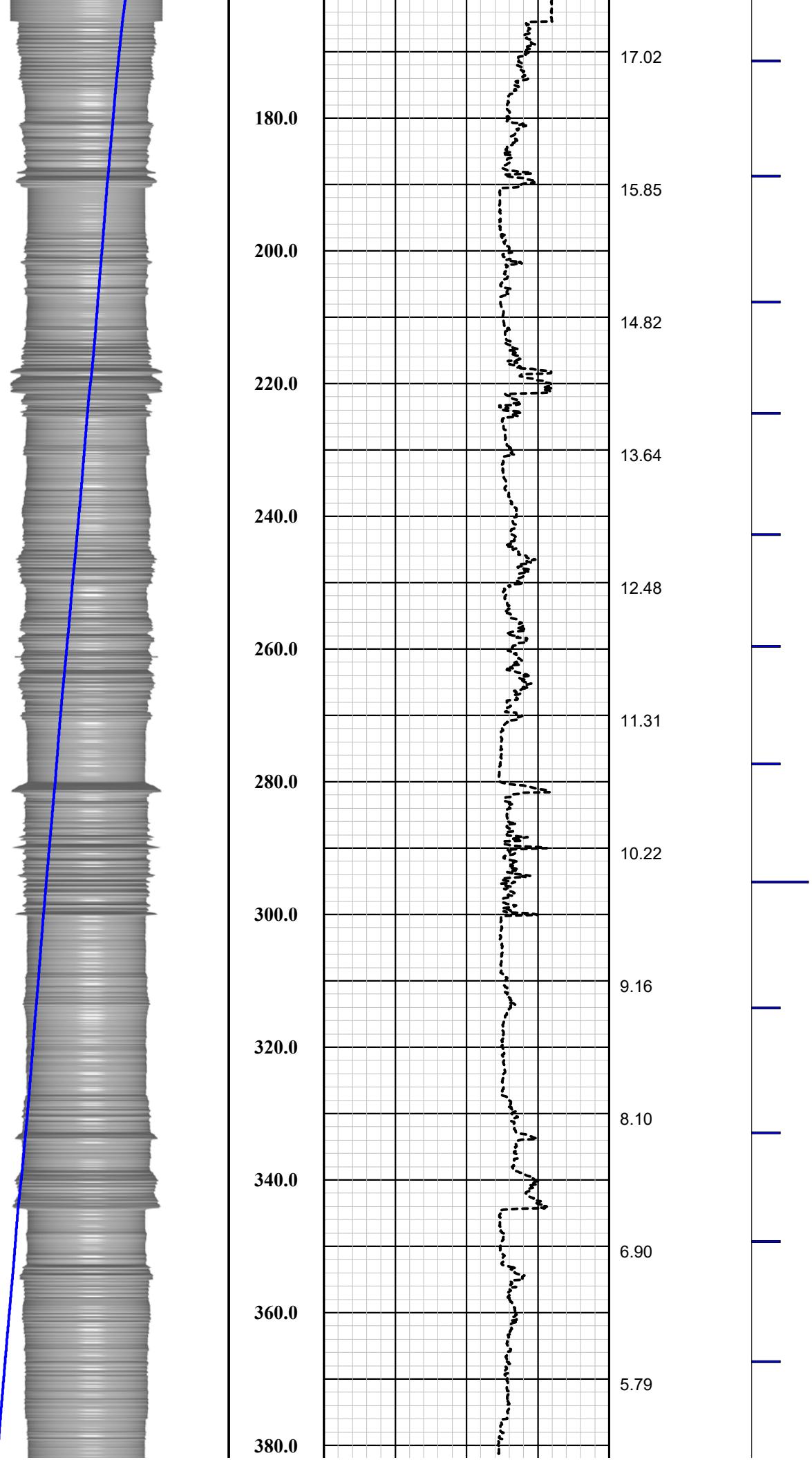
Caliper Arms Used: 15"

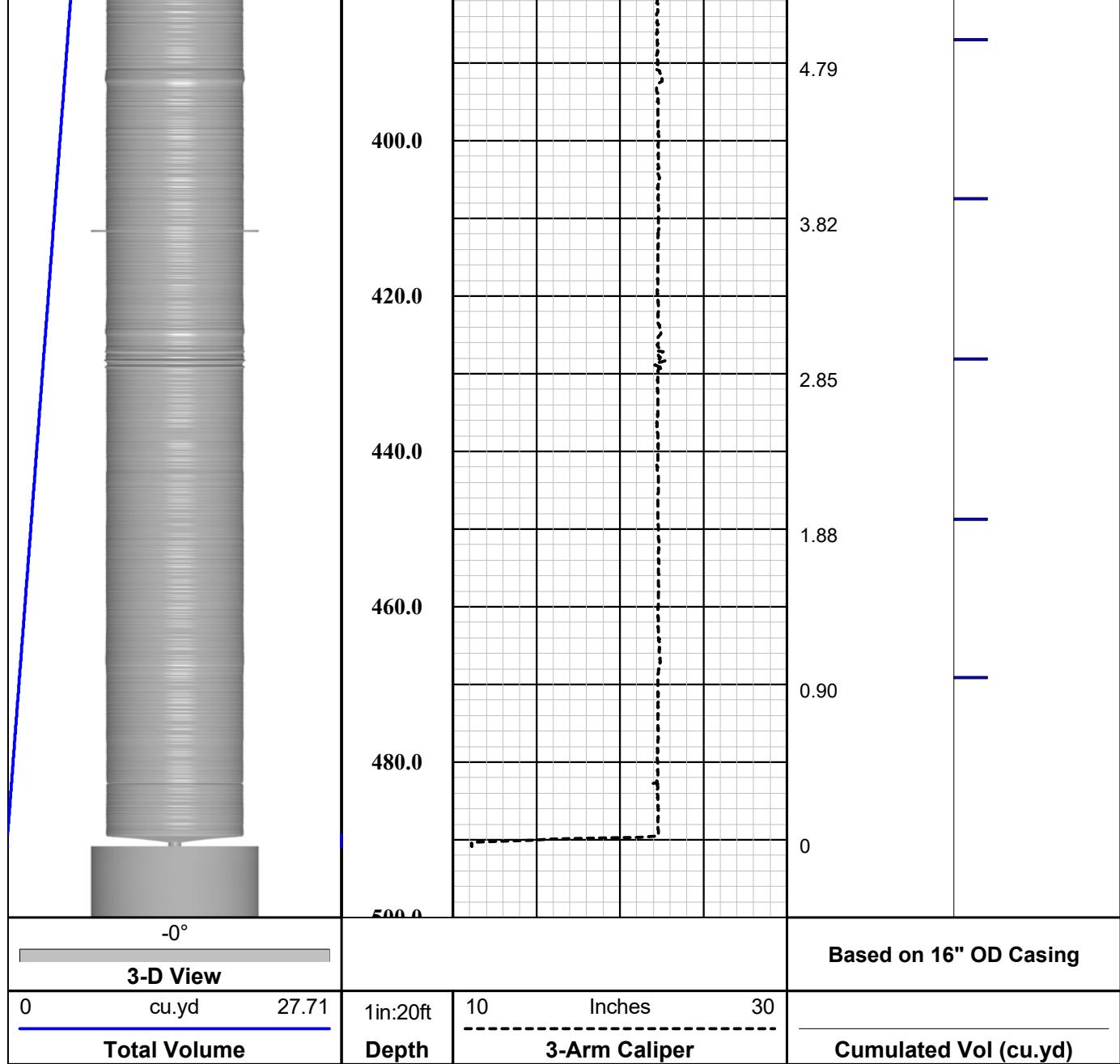
Calibration Points: 10" & 21"

Disclaimer:

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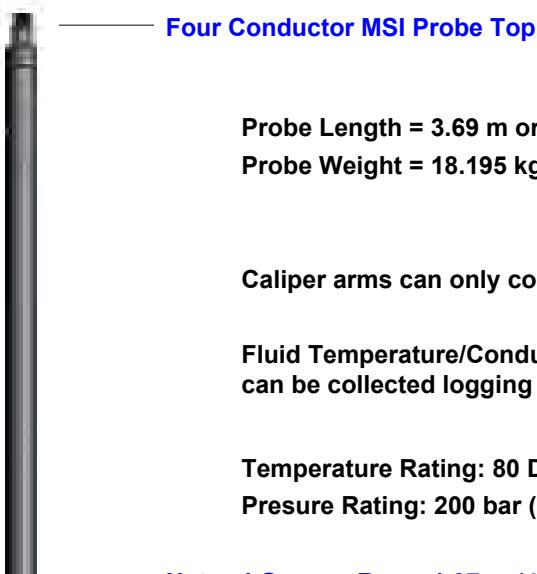




QL40 Gamma-Caliper-Temperature-Fluid Conductivity

Probe Top = Depth Ref.

Tool SN: 5613, 5979, 6161 & 6292



Probe Length = 3.69 m or 12.12 ft

Probe Weight = 18.195 kg or 40.11 lbs

Caliper arms can only collect data logging up hole

Fluid Temperature/Conductivity and Natural Gamma
can be collected logging up and down hole

Temperature Rating: 80 Deg C (176 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 1.07 m (42.12 in)



3-Arm Caliper = 1.78 m (70.27 in)

Available Arm Sizes: 3", 9", and 15"

FTC (Fluid Temperature/Conductivity) = 0.78 m (30.71 in)

1.57" or 40.0 mm Diameter



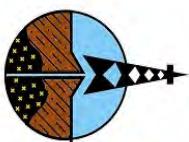
**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	R-09
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final

Caliper w/ Volume Calculation Summary



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER		
WELL ID	R-09		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: 3-ARM CALIPER MORE: W/ VOLUME CALC.			OTHER SERVICES SONIC E-LOG DEVIATION
LOCATION	SEC	TWP	RGE
PERMANENT DATUM	ELEVATION		
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	
DRILLING MEAS. FROM	GROUND LEVEL		
DATE	03-08-18	TYPE FLUID IN HOLE	K.B.
RUN No	1	MUD WEIGHT	D.F.
TYPE LOG	VOLUME CALCULATION	VISCOSITY	G.L.
DEPTH-DRILLER	1244 FT	LEVEL	
DEPTH-LOGGER	1236 FT	MAX. REC. TEMP.	MUD
BTM LOGGED INTERVAL	1236 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	HYDRO-RESOURCES	LOGGING TRUCK	TRUCK #310
RECORDED BY / Logging Eng.	E. TURNER / D. BEAM	TOOL STRING/SN	QL COMBO TOOL SN 6292
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	8:00 PM
RUN	BOREHOLE RECORD		CASING RECORD
NO.	BIT	FROM	TO
1	? IN	SURFACE	40 FT
2	22 IN	40 FT	TOTAL DEPTH
3	14.75 IN	495 FT	TOTAL DEPTH
COMMENTS:			

Tool Summary:					
Date	03-08-18	Date	03-08-18	Date	03-08-18
Run No.	1	Run No.	2	Run No.	3
Tool Model	QL COMBO TOOL	Tool Model	GEOVISTA E-LOG	Tool Model	MSI 60MM SONIC
Tool SN	6292	Tool SN	4035	Tool SN	5050
From	SURFACE	From	490 FT	From	495 FT
To	1236 FT	To	1236 FT	To	1236 FT
Recorded By	E. TURNER	Recorded By	E. TURNER	Recorded By	E. TURNER
Truck No	310	Truck No	310	Truck No	310
Operation Check	03-06-18	Operation Check	03-06-18	Operation Check	03-06-18
Calibration Check	03-06-18	Calibration Check	03-06-18	Calibration Check	N/A
Time Logged	9:10 PM	Time Logged	10:00 PM	Time Logged	10:55 PM

Date	03-08-18	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	QL DVA	Tool Model		Tool Model	
Tool SN	142201	Tool SN		Tool SN	
From	490 FT	From		From	
To	1236 FT	To		To	
Recorded By	E. TURNER	Recorded By		Recorded By	
Truck No	310	Truck No		Truck No	
Operation Check	03-06-18	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	11:45 PM	Time Logged		Time Logged	

Additional Comments:

Caliper Arms Used: 15"

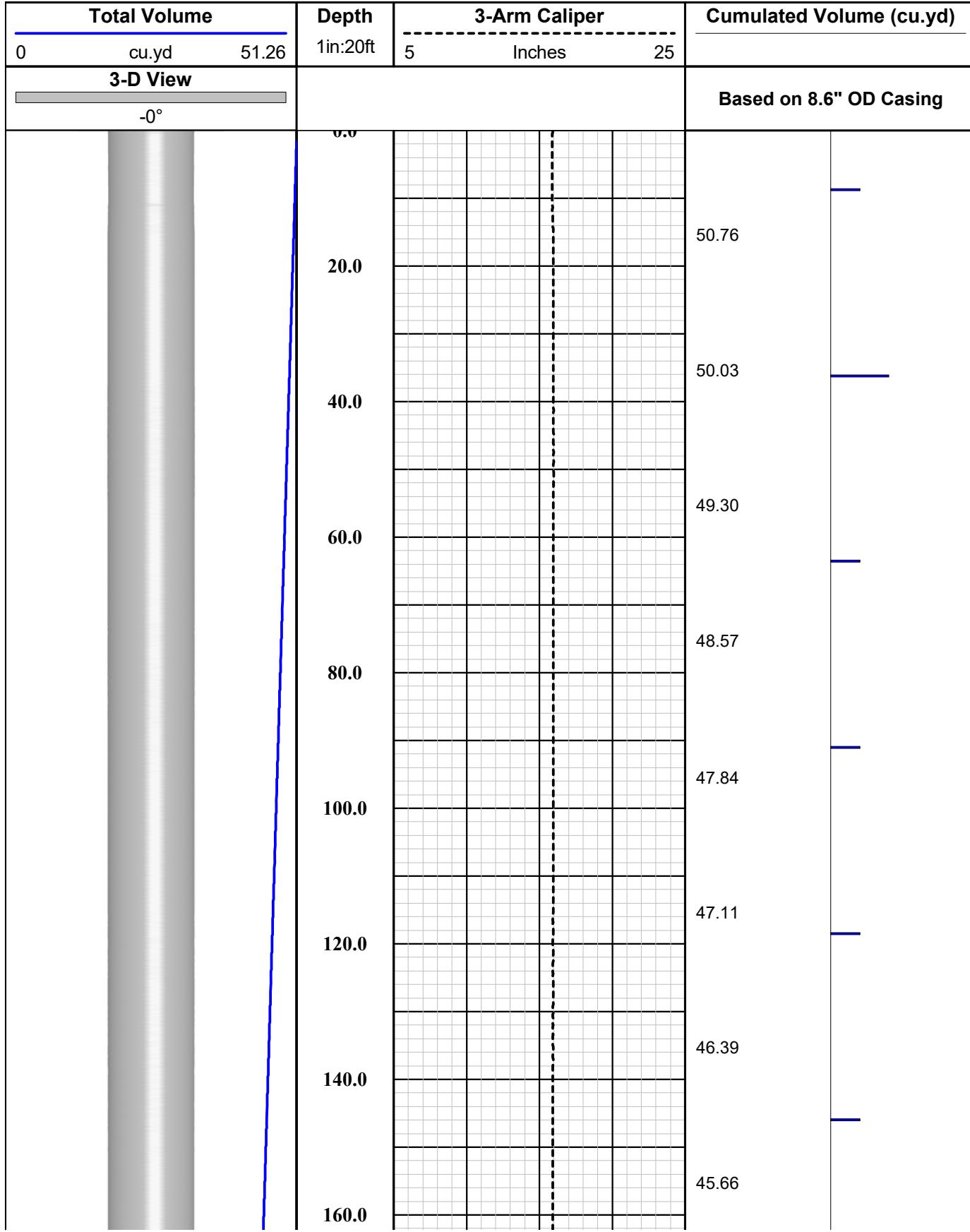
Calibration Points: 10" & 21"

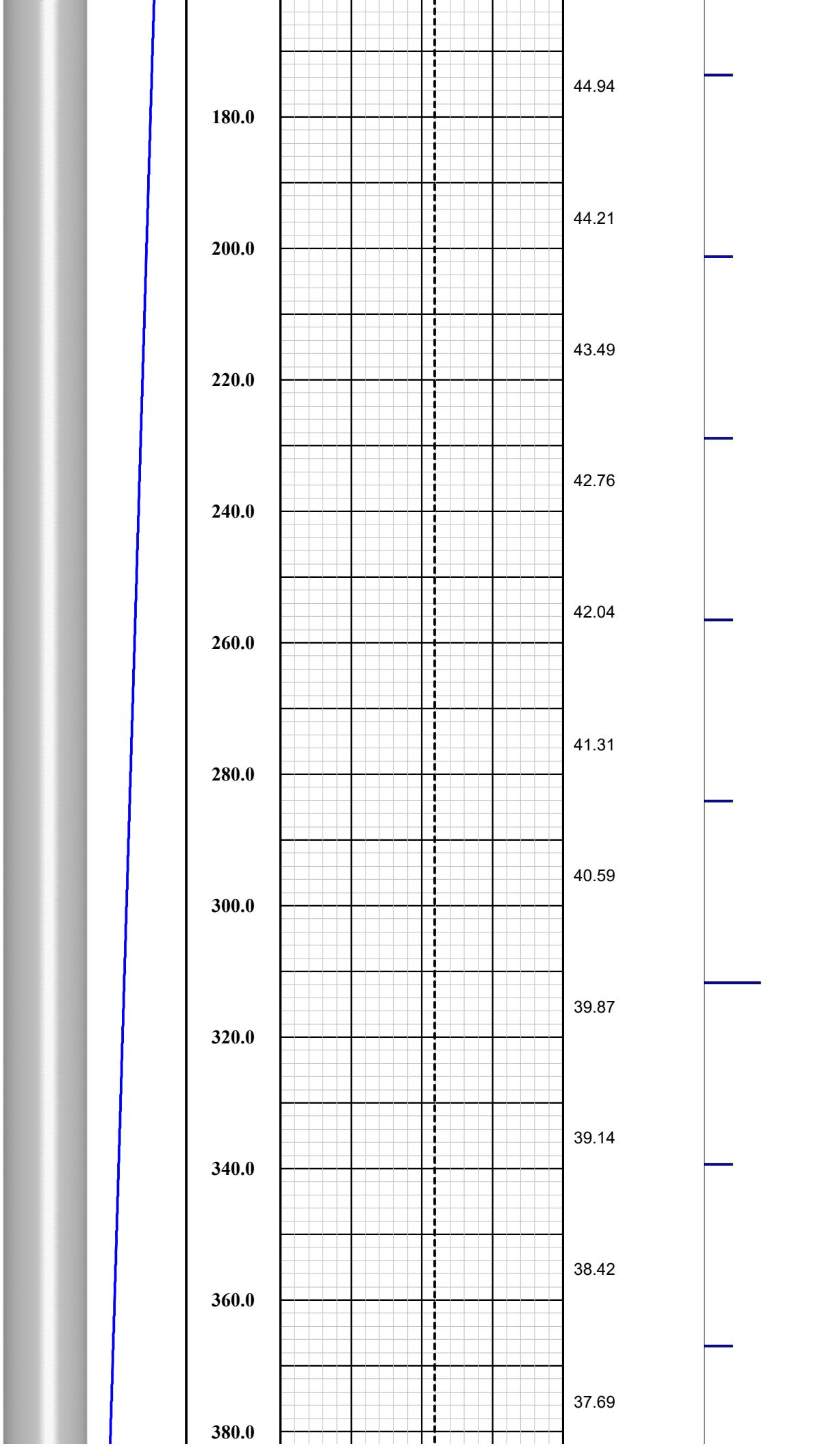
E-Log Calibration Range: 1 - 1,000 OHM-M

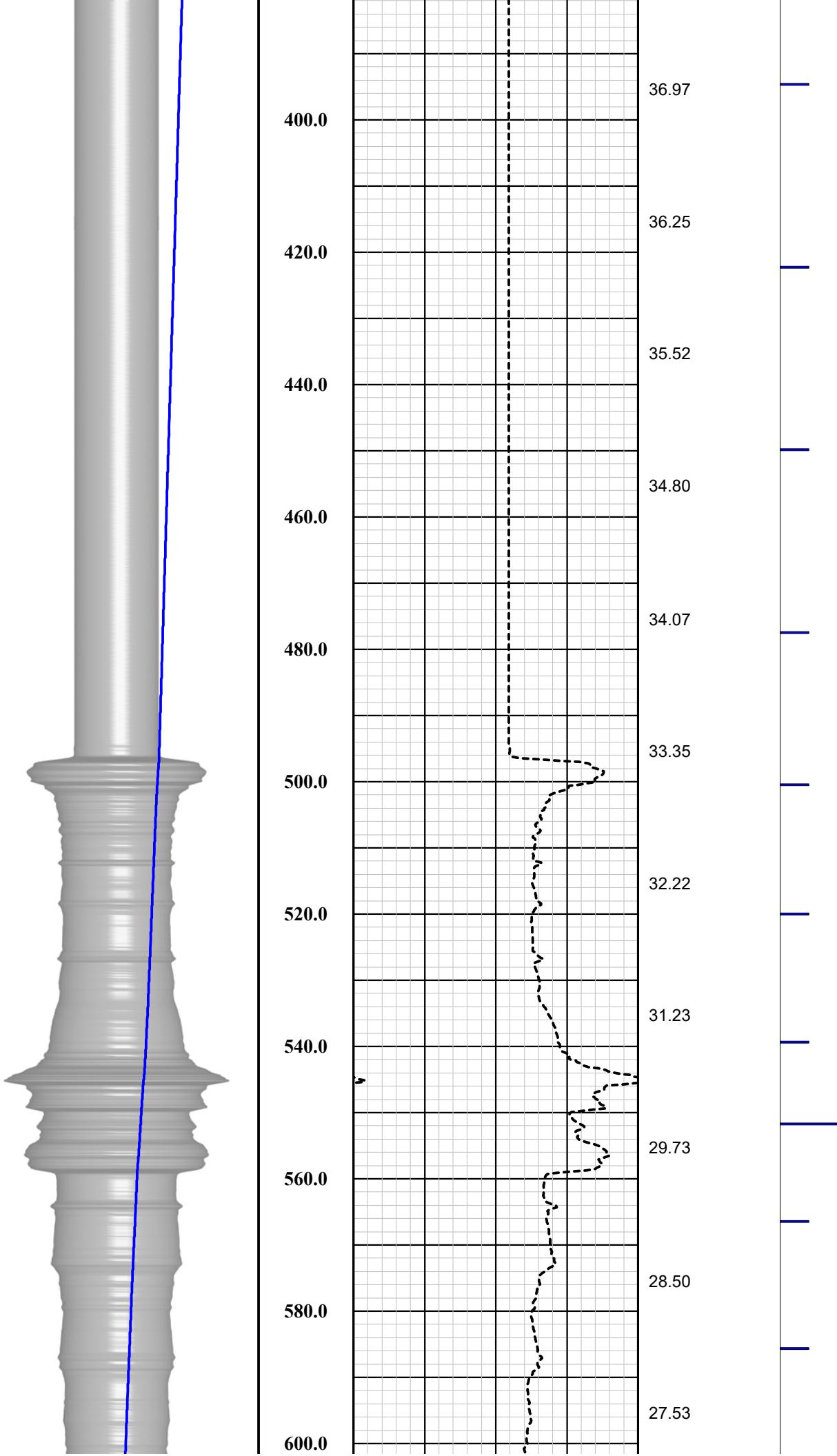
Calibration Points: 1 & 1,000 OHM-M

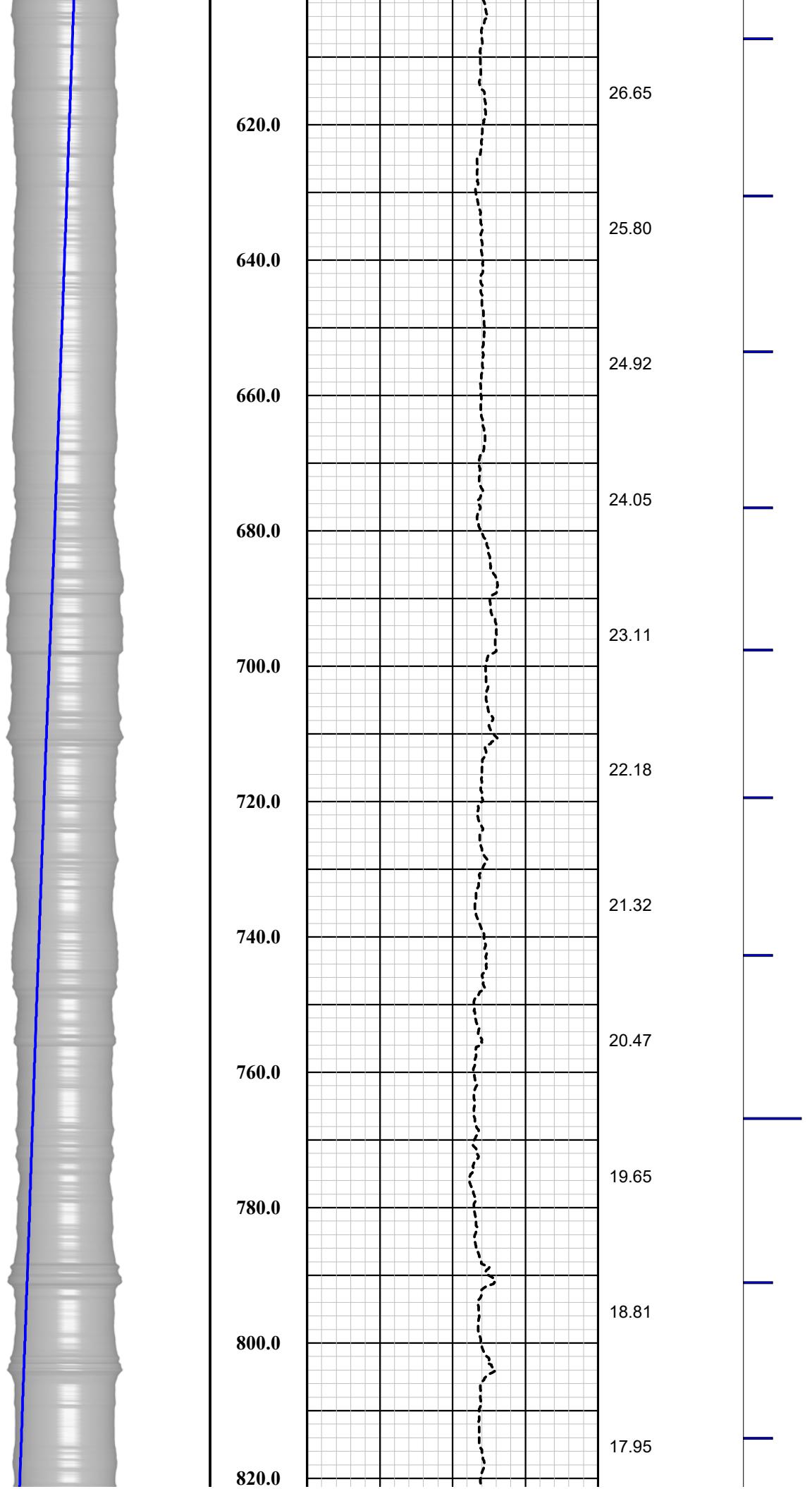
Disclaimer:

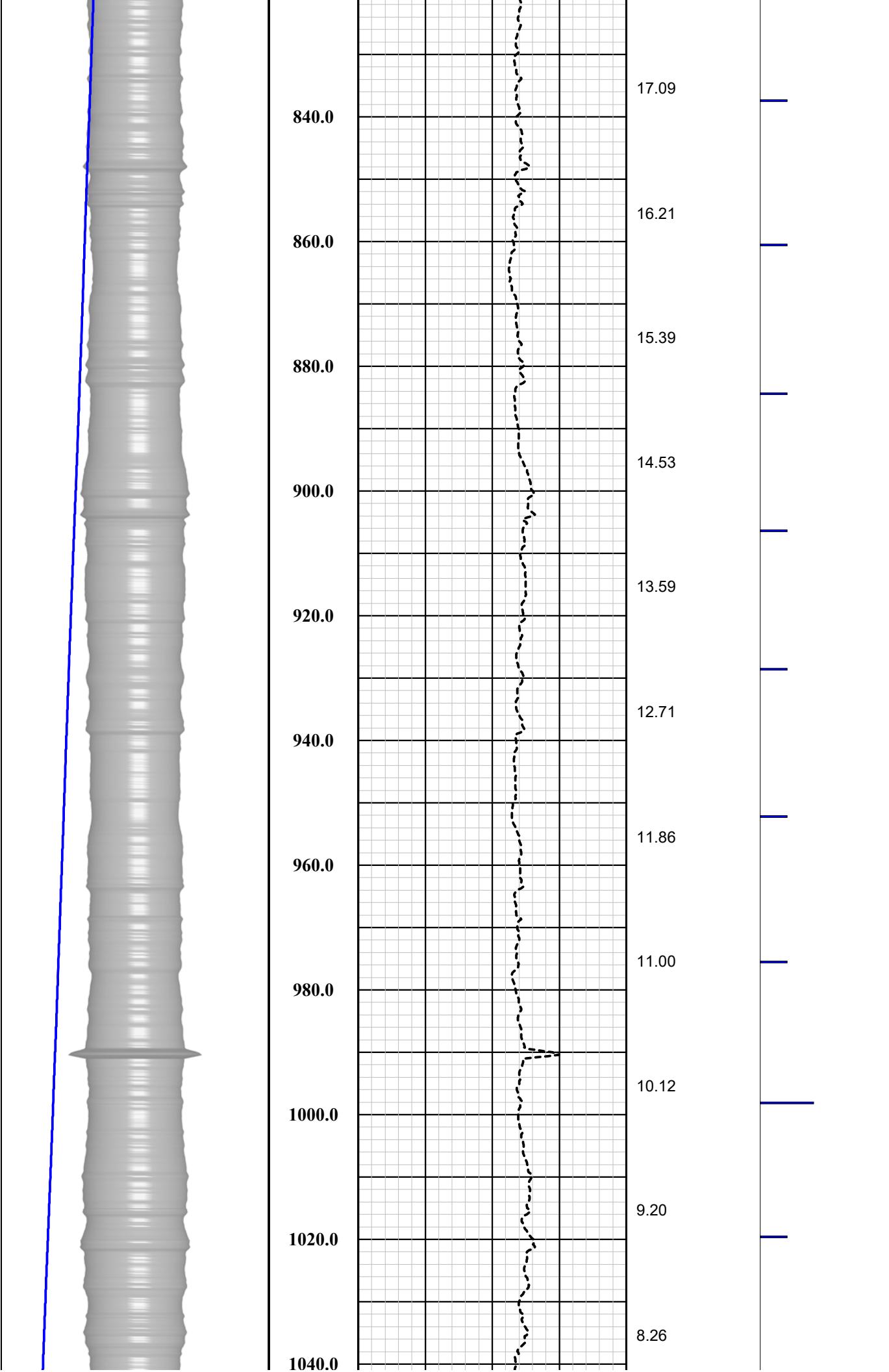
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

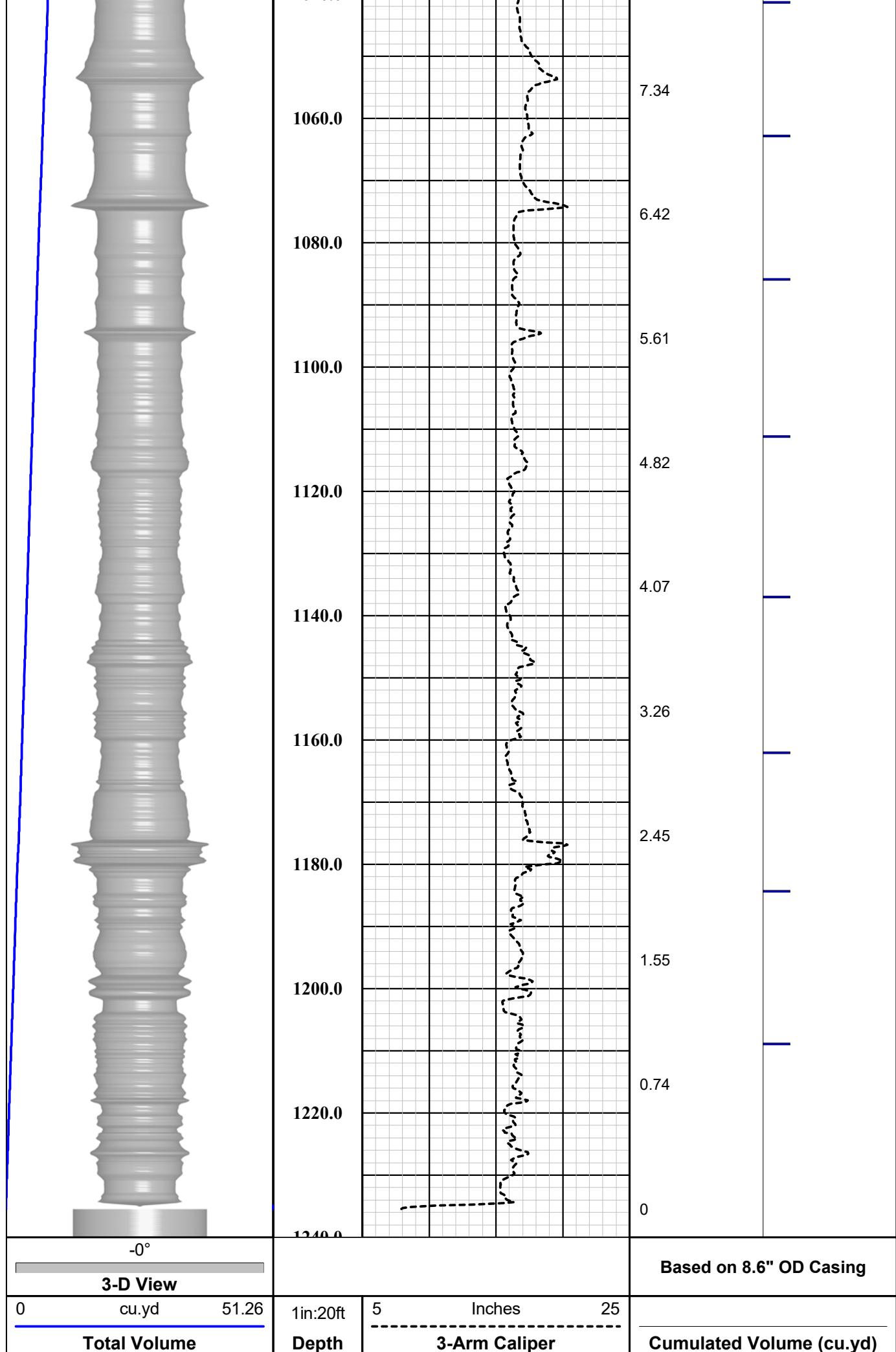








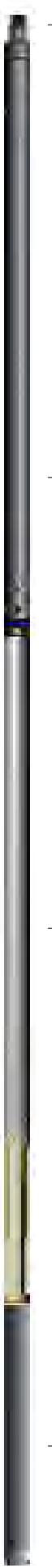




QL40 Gamma-Caliper-Temperature-Fluid Conductivity

Probe Top = Depth Ref.

Tool SN: 5613, 5979, 6161 & 6292



Four Conductor MSI Probe Top

Probe Length = 3.69 m or 12.12 ft

Probe Weight = 18.195 kg or 40.11 lbs

Caliper arms can only collect data logging up hole

Fluid Temperature/Conductivity and Natural Gamma
can be collected logging up and down hole

Temperature Rating: 80 Deg C (176 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 1.07 m (42.12 in)

3-Arm Caliper = 1.78 m (70.27 in)

Available Arm Sizes: 3", 9", and 15"

FTC (Fluid Temperature/Conductivity) = 0.78 m (30.71 in)



**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	R-09
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final

Caliper w/ Volume Calculation Summary

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR
FLORENCE COPPER and FLORENCE COPPER
R-09

Saturday - November 18, 2017



This Wellbore Interpretation Package represents our best efforts to provide a correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical or other types of measurements, we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by Customer resulting from any interpretation made by this document. We do not warrant or guarantee the accuracy of the data, specifically including (but without limitations) the accuracy of data transmitted by electronic process, and we will not be responsible for accidental or intentional interception of such data by third parties. Our employees are not empowered to change or otherwise modify the attached interpretation. Furthermore, along with Eagle Pro Software we do not warrant or guarantee the accuracy of the programming techniques employed to produce this document. By accepting this Interpretation Package, the Customer agrees to the foregoing, and to our General Terms and Conditions.

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company:	FLORENCE COPPER		Well Owner:	FLORENCE COPPER	
County:	PINAL	State:	Arizona	Country:	United States
Well Number:	R-09	Survey Date:	Saturday - November 18, 2017	Magnetic Declination:	Declination Correction Not Used
Field:	FLORENCE	Drift Calculation Methodology:			Balanced Tangential Method
Location:	FLORENCE COPPER				
Remarks:					
Witness:	HYDROLOGIC	Vehicle No.:	310	Invoice No.:	Operator: E. BEAM
Tool:	Compass - 143003		Lat.:	Long.:	Sec.: Twp.: Rge.:

MEASURED DATA			DATA COMPUTATIONS						
DEPTHs, feet	INCLINATIONS, degrees	AZIMUTHs, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEg SEV., degrees per 20 Feet	DOGLEg SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
0	0.26	208.74	0.00						
20	0.26	208.74	19.99	-0.080	-0.044	1.00	0.00	0.09' (1.08")	208.70
40	0.24	208.74	39.98	-0.157	-0.086	0.41	0.00	0.18' (2.16")	208.80
60	0.12	208.74	59.97	-0.212	-0.116	0.96	0.01	0.24' (2.88")	208.70
80	0.18	208.74	79.96	-0.258	-0.141	0.84	0.01	0.29' (3.48")	208.70
100	0.28	162.06	99.96	-0.332	-0.141	0.42	4.35	0.36' (4.32")	203.00
120	0.30	193.16	119.95	-0.429	-0.138	0.13	2.94	0.45' (5.40")	197.80
140	0.44	142.74	139.94	-0.541	-0.103	0.43	4.67	0.55' (6.60")	190.80
160	0.12	170.96	159.93	-0.623	-0.053	0.83	2.67	0.63' (7.56")	184.90
180	0.22	107.72	179.92	-0.655	-0.013	0.95	5.75	0.66' (7.92")	181.10
200	0.98	066.18	199.91	-0.598	0.180	0.37	3.89	0.62' (7.44")	163.20
220	0.22	134.44	219.90	-0.556	0.364	1.00	6.16	0.66' (7.92")	146.80
240	0.52	244.96	239.89	-0.621	0.309	1.00	9.02	0.69' (8.28")	153.50
260	0.80	115.08	259.88	-0.719	0.353	0.34	9.94	0.80' (9.60")	153.80
280	0.48	279.40	279.87	-0.765	0.397	0.93	10.87	0.86' (10.32")	152.60
300	0.18	121.04	299.86	-0.768	0.341	0.78	10.78	0.84' (10.08")	156.00
320	0.36	219.78	319.85	-0.832	0.328	0.53	8.33	0.89' (10.68")	158.50
340	0.20	173.56	339.84	-0.915	0.292	0.00	4.31	0.96' (11.52")	162.30

Page No. 1 True Vertical Depth: **479.77'** Final Drift Distance: **.65' (7.80")** Final Drift Bearing: **136.20°**

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC
(480) 926-4558

PLANE OF DRIFT VIEW - R-09

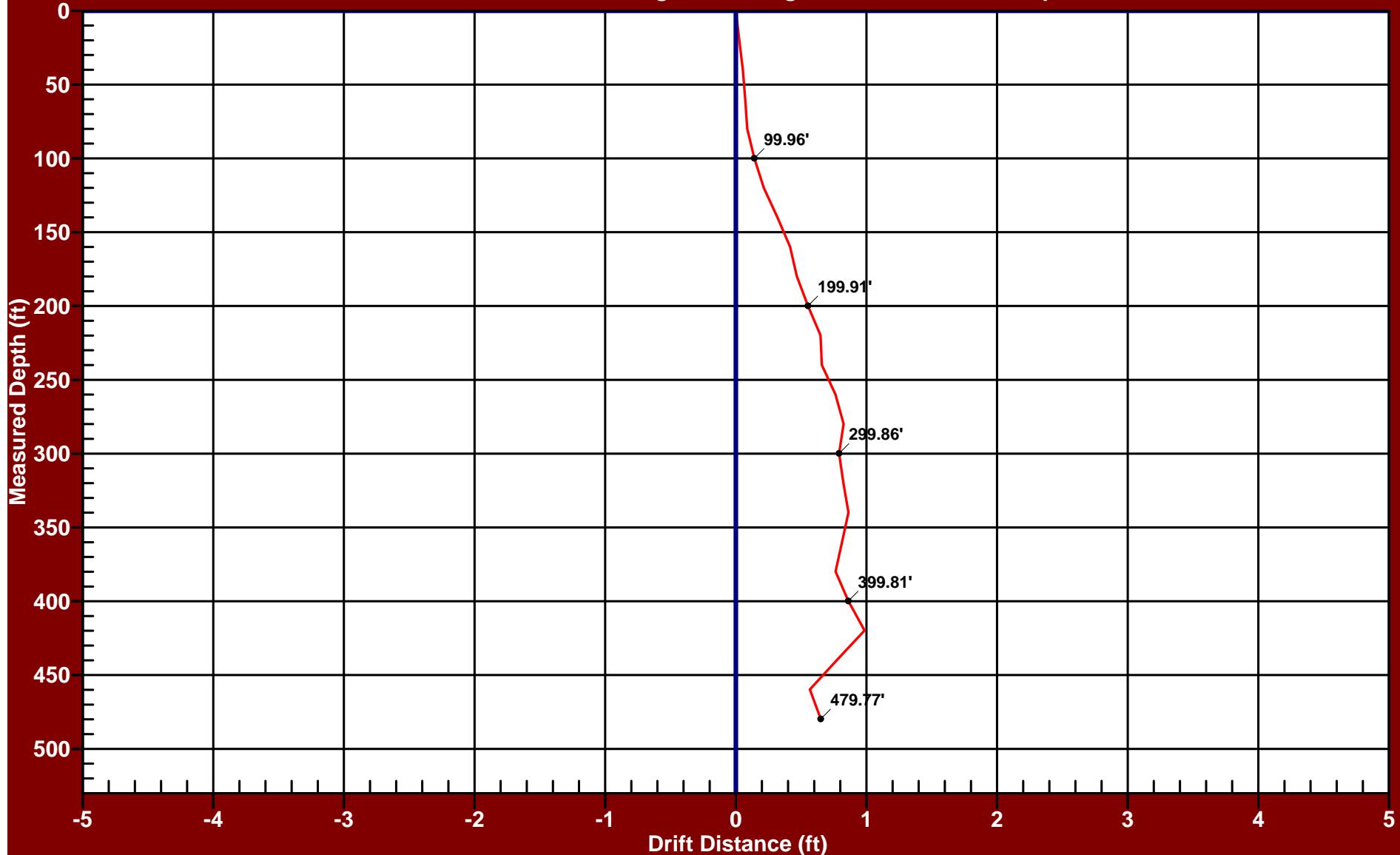
FLORENCE COPPER

FLORENCE COPPER

Drift Distance = 0.65 Feet

Drift Bearing = 136.2 Degrees

True Vertical Depth = 479.77 Feet



Date of Survey: Saturday - November 18, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - R-09

FLORENCE COPPER

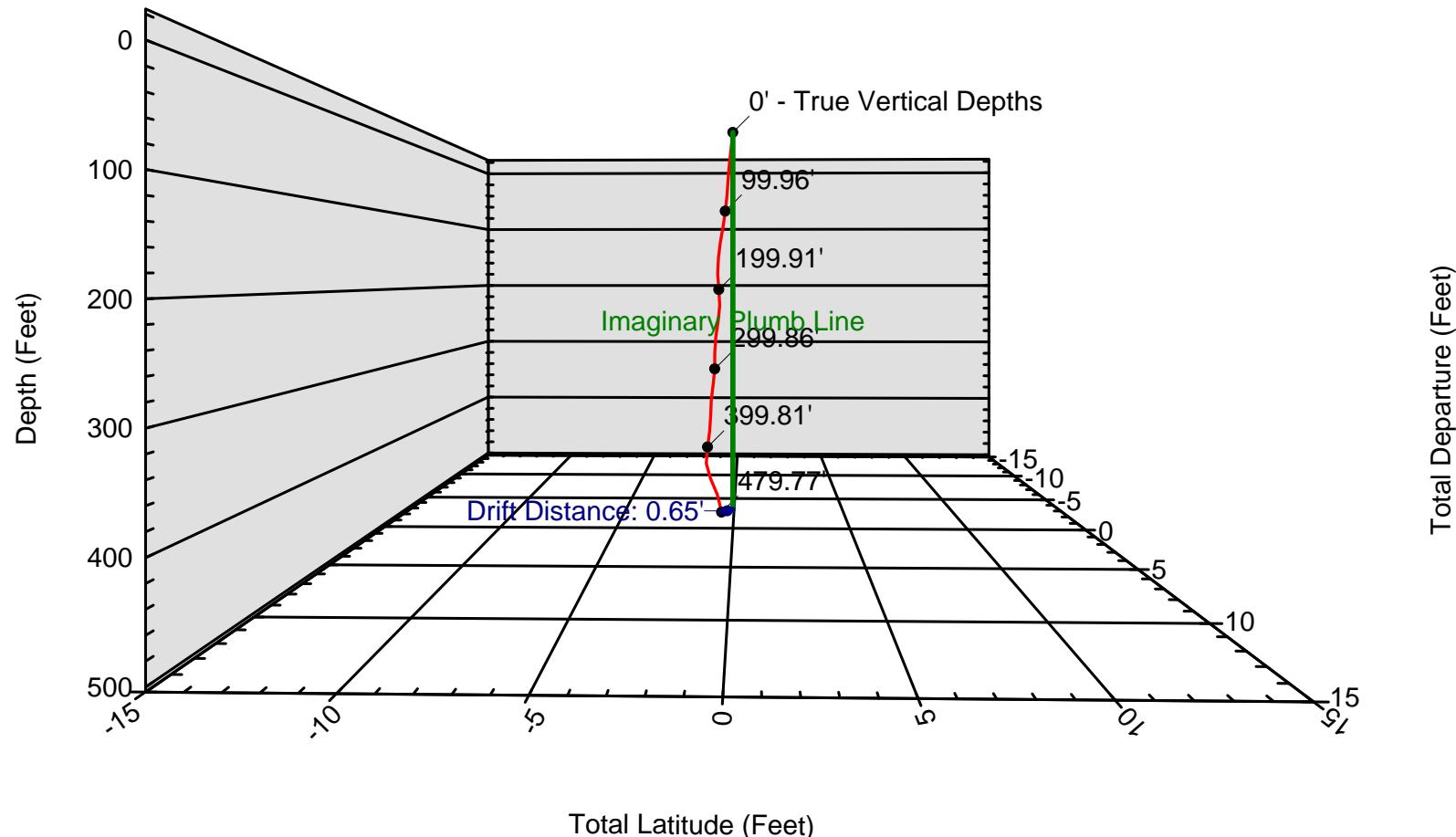
FLORENCE COPPER

Drift Distance = 0.65 Feet

Drift Bearing = 136.2 Degrees

True Vertical Depth = 479.77 Feet

271.0



Date of Survey: Saturday - November 18, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - R-09

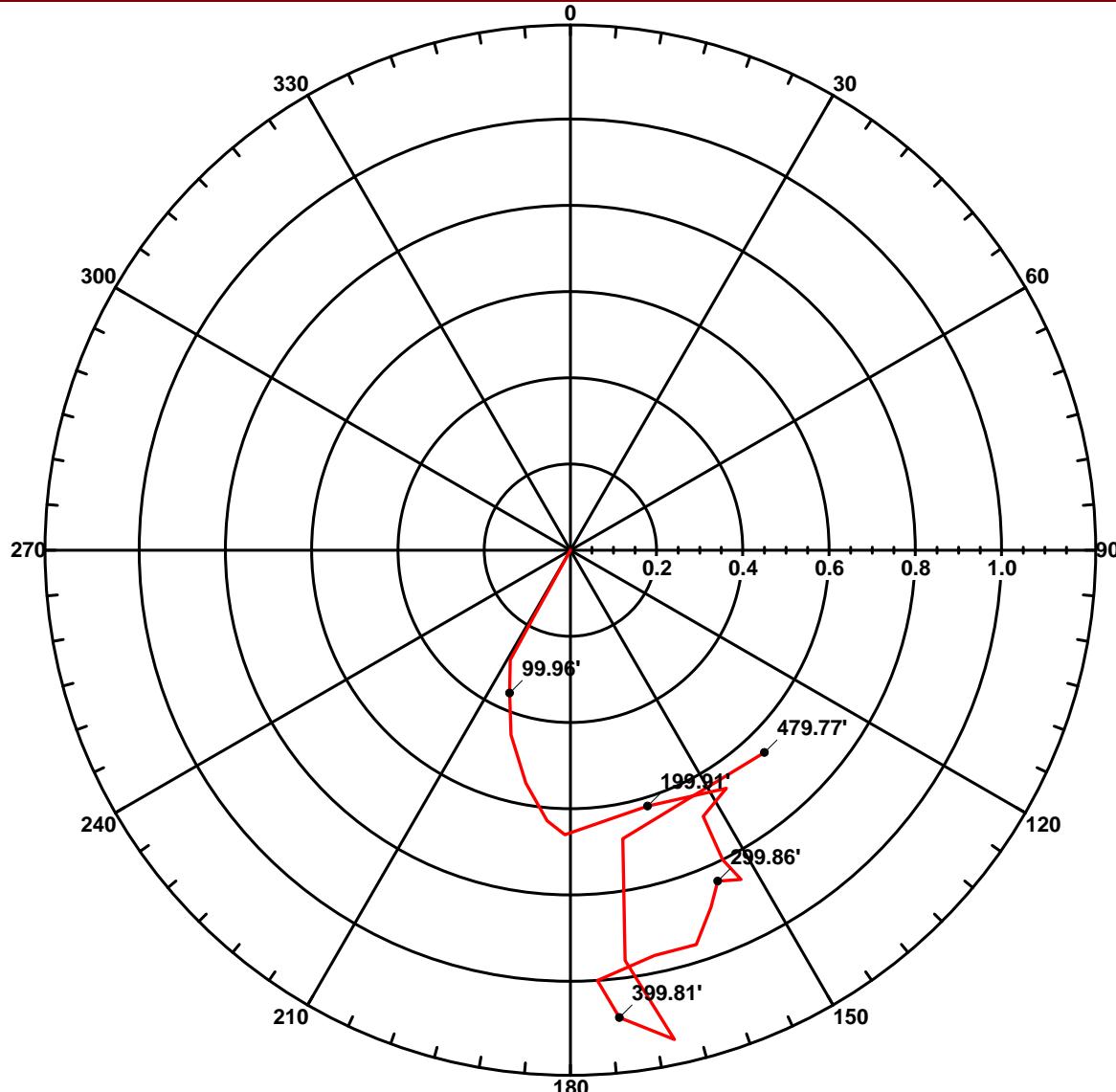
FLORENCE COPPER

FLORENCE COPPER

Drift Distance = 0.65 Feet

Drift Bearing = 136.2 Degrees

True Vertical Depth = 479.77 Feet



Date of Survey: Saturday - November 18, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

EASTING RECTANGULAR VIEW - R-09

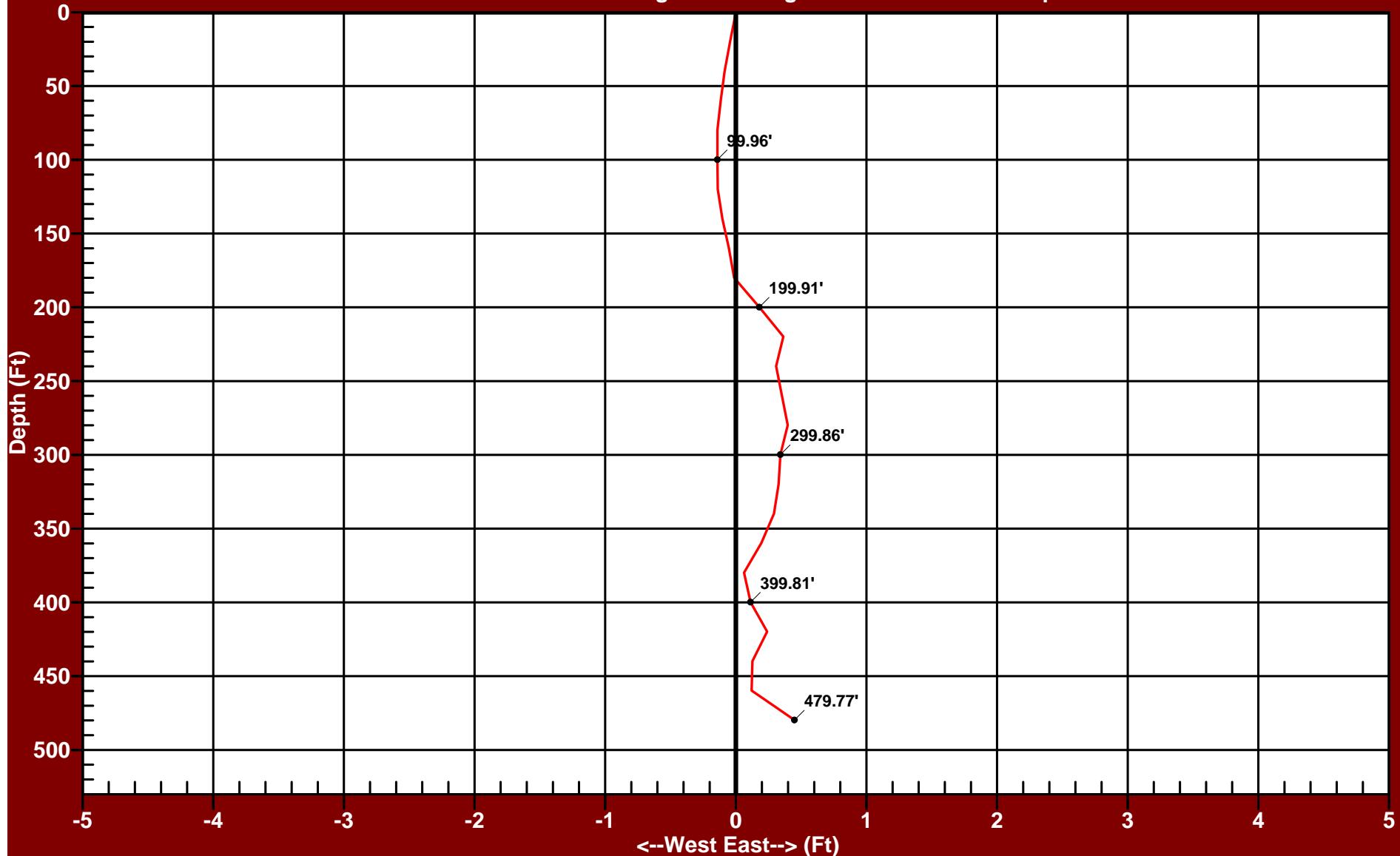
FLORENCE COPPER

FLORENCE COPPER

Drift Distance = 0.65 Feet

Drift Bearing = 136.2 Degrees

True Vertical Depth = 479.77 Feet



Date of Survey: Saturday - November 18, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

NORTHING RECTANGULAR VIEW - R-09

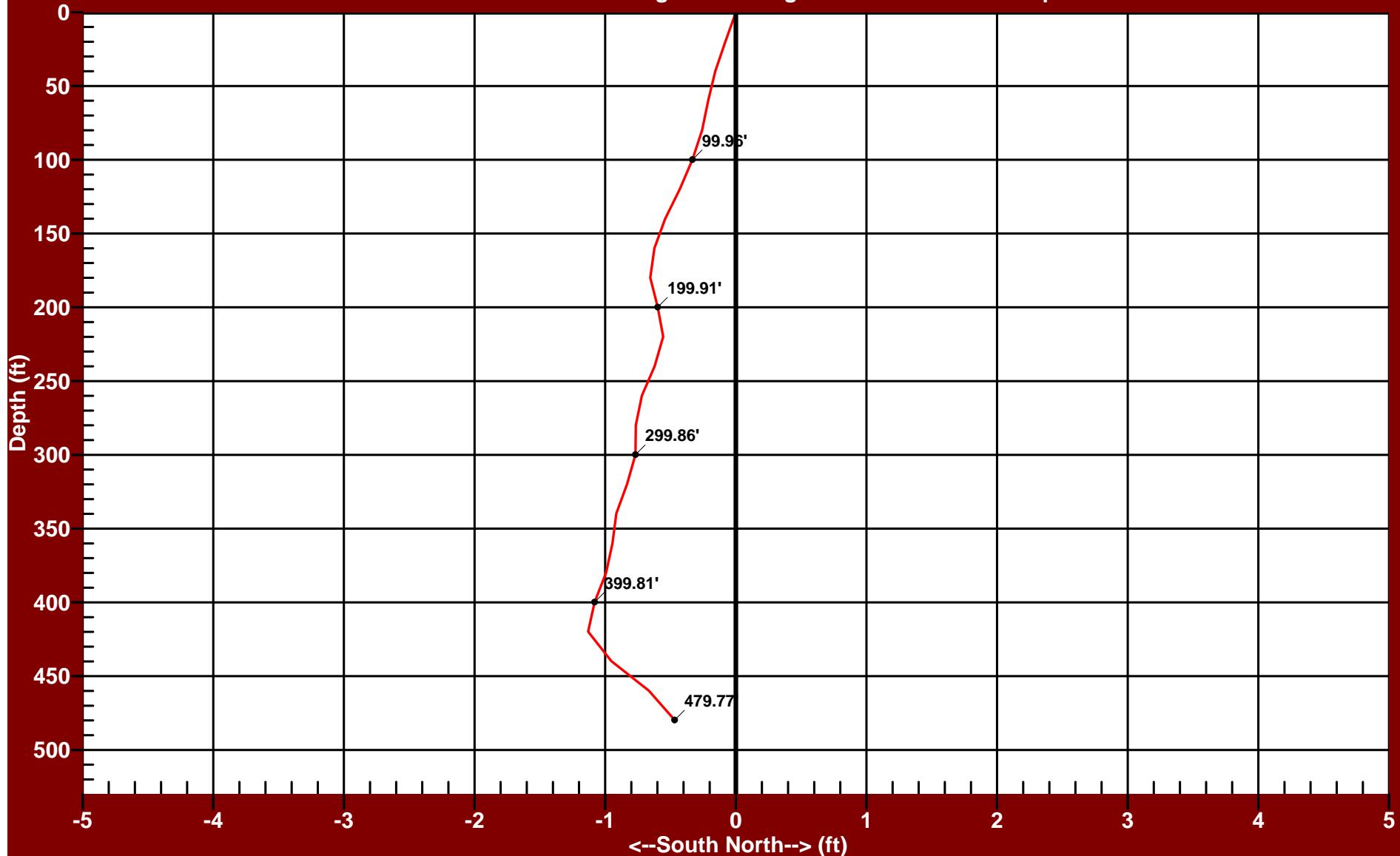
FLORENCE COPPER

FLORENCE COPPER

Drift Distance = 0.65 Feet

Drift Bearing = 136.2 Degrees

True Vertical Depth = 479.77 Feet



Date of Survey: Saturday - November 18, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR
HYDRO RESOURCES and FLORENCE COPPER
R-09

Friday - March 9, 2018



This Wellbore Interpretation Package represents our best efforts to provide a correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical or other types of measurements, we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by Customer resulting from any interpretation made by this document. We do not warrant or guarantee the accuracy of the data, specifically including (but without limitations) the accuracy of data transmitted by electronic process, and we will not be responsible for accidental or intentional interception of such data by third parties. Our employees are not empowered to change or otherwise modify the attached interpretation. Furthermore, along with Eagle Pro Software we do not warrant or guarantee the accuracy of the programming techniques employed to produce this document. By accepting this Interpretation Package, the Customer agrees to the foregoing, and to our General Terms and Conditions.

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company:	HYDRO RESOURCES		Well Owner:	FLORENCE COPPER		
County:	PINAL	State:	Arizona	Country:	United States	
Well Number:	R-09	Survey Date:	Friday - March 9, 2018	Magnetic Declination:	Declination Correction Not Used	
Field:	FLORENCE COPPER		Drift Calculation Methodology:	Balanced Tangential Method		
Location:						
Remarks:						
Witness:	CHAD - H&A	Vehicle No.:	310	Invoice No.:	Operator:	E. TURNER
Tool:	Compass - 6002		Lat.:	Long.:	Sec.:	Twp.:
						Rge.:

MEASURED DATA			DATA COMPUTATIONS		
DEPTHs, feet	INCLINATIONS, degrees	AZIMUTHs, degrees	DRIFT DIST., feet	DRIFT BGR., degrees	
496	0.10	143.10			
496	0.10	233.90	0.00' (.00")		188.50
497	0.10	208.50	0.00' (.00")		198.90
497	0.20	194.80	0.00' (.00")		203.90
498	0.20	162.70	0.00' (.00")		191.60
498	0.10	177.70	0.01' (.12")		186.60
499	0.20	153.00	0.01' (.12")		184.60
499	0.40	113.10	0.01' (.12")		173.30
500	0.40	121.90	0.01' (.12")		157.00
500	0.40	109.10	0.01' (.12")		148.20
501	0.30	128.10	0.02' (.24")		142.00
501	0.40	106.30	0.02' (.24")		136.30
502	0.30	119.60	0.02' (.24")		131.80
502	0.30	119.50	0.02' (.24")		129.90
503	0.30	135.40	0.03' (.36")		129.60
503	0.30	125.60	0.03' (.36")		130.40
504	0.30	114.20	0.03' (.36")		129.90
504	0.60	117.80	0.04' (.48")		128.30

Page No. 1 True Vertical Depth: 1217.75' Final Drift Distance: 3.54' (42.48") Final Drift Bearing: 149.10°
Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

R-09

MEASURED DATA

DATA COMPUTATIONS

DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
505	0.20°	149.30°	0.04' (.48")	127.90
505	0.30°	134.60°	0.04' (.48")	128.40
506	0.30°	128.80°	0.04' (.48")	129.20
506	0.20°	136.30°	0.05' (.60")	129.60
507	0.30°	121.80°	0.05' (.60")	128.80
507	0.20°	127.70°	0.05' (.60")	128.10
508	0.20°	128.90°	0.05' (.60")	127.80
508	0.30°	132.60°	0.05' (.60")	128.10
509	0.20°	125.50°	0.06' (.72")	127.60
509	0.30°	153.20°	0.06' (.72")	127.60
510	0.20°	139.30°	0.06' (.72")	128.70
510	0.20°	135.30°	0.06' (.72")	129.20
511	0.30°	123.00°	0.06' (.72")	129.10
511	0.30°	110.80°	0.07' (.84")	128.20
512	0.30°	138.00°	0.07' (.84")	128.10
512	0.20°	136.90°	0.07' (.84")	128.20
513	0.20°	135.00°	0.07' (.84")	128.80
513	0.20°	132.80°	0.07' (.84")	128.90
514	0.30°	120.00°	0.08' (.96")	128.80
514	0.20°	140.60°	0.08' (.96")	128.50
515	0.20°	136.50°	0.08' (.96")	128.40
515	0.20°	141.60°	0.08' (.96")	128.60
516	0.30°	140.00°	0.08' (.96")	128.80
516	0.40°	131.10°	0.09' (1.08")	129.30
517	0.20°	141.90°	0.09' (1.08")	129.50
517	0.20°	135.40°	0.09' (1.08")	129.70
518	0.20°	133.20°	0.09' (1.08")	129.70
518	0.20°	131.60°	0.09' (1.08")	129.70
519	0.20°	114.60°	0.09' (1.08")	129.60
519	0.20°	132.60°	0.10' (1.20")	129.70
520	0.20°	130.40°	0.10' (1.20")	129.90
520	0.30°	131.10°	0.10' (1.20")	130.00
521	0.30°	120.20°	0.10' (1.20")	129.60

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

R-09

MEASURED DATA

DATA COMPUTATIONS

DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
521	0.40°	114.70°	0.10' (1.20")	129.40
522	0.30°	123.80°	0.11' (1.32")	128.90
522	0.40°	115.40°	0.11' (1.32")	128.30
523	0.20°	140.00°	0.11' (1.32")	127.90
523	0.20°	126.50°	0.11' (1.32")	127.90
524	0.30°	132.30°	0.12' (1.44")	127.90
524	0.20°	108.60°	0.12' (1.44")	127.60
525	0.20°	118.70°	0.12' (1.44")	127.30
525	0.20°	134.50°	0.12' (1.44")	127.20
526	0.20°	130.40°	0.12' (1.44")	127.40
526	0.30°	113.70°	0.13' (1.56")	127.30
527	0.20°	126.50°	0.13' (1.56")	127.10
527	0.20°	115.20°	0.13' (1.56")	127.00
528	0.20°	125.80°	0.13' (1.56")	127.00
528	0.20°	131.80°	0.13' (1.56")	127.20
529	0.30°	117.20°	0.13' (1.56")	127.20
529	0.20°	136.10°	0.14' (1.68")	127.10
530	0.20°	122.30°	0.14' (1.68")	127.00
530	0.20°	126.80°	0.14' (1.68")	127.00
531	0.30°	119.50°	0.14' (1.68")	127.00
531	0.30°	121.20°	0.14' (1.68")	126.80
532	0.20°	130.30°	0.15' (1.80")	126.80
532	0.30°	123.40°	0.15' (1.80")	126.60
533	0.20°	126.70°	0.15' (1.80")	126.50
533	0.20°	124.20°	0.15' (1.80")	126.30
534	0.20°	123.90°	0.15' (1.80")	126.40
534	0.30°	129.10°	0.16' (1.92")	126.50
535	0.20°	117.30°	0.16' (1.92")	126.30
535	0.30°	125.50°	0.16' (1.92")	126.20
536	0.20°	125.80°	0.16' (1.92")	126.10
536	0.20°	104.40°	0.16' (1.92")	125.80
537	0.20°	136.40°	0.17' (2.04")	125.80
537	0.20°	134.40°	0.17' (2.04")	126.00

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

R-09

MEASURED DATA

DATA COMPUTATIONS

DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
538	0.20°	112.50°	0.17' (2.04")	126.00
538	0.30°	121.70°	0.17' (2.04")	126.00
539	0.20°	134.20°	0.17' (2.04")	125.90
539	0.30°	138.30°	0.17' (2.04")	125.90
540	0.20°	120.40°	0.18' (2.16")	126.20
540	0.20°	164.30°	0.18' (2.16")	126.20
541	0.20°	128.40°	0.18' (2.16")	126.30
541	0.30°	124.90°	0.18' (2.16")	126.20
542	0.20°	119.40°	0.18' (2.16")	126.00
542	0.30°	128.10°	0.19' (2.28")	125.90
543	0.20°	118.70°	0.19' (2.28")	125.80
543	0.20°	123.10°	0.19' (2.28")	125.70
544	0.40°	100.80°	0.19' (2.28")	125.60
544	0.30°	124.40°	0.19' (2.28")	125.50
545	0.20°	110.20°	0.20' (2.40")	125.30
545	0.30°	152.60°	0.20' (2.40")	125.40
546	0.20°	112.40°	0.20' (2.40")	125.50
546	0.20°	113.20°	0.20' (2.40")	125.30
547	0.50°	112.50°	0.21' (2.52")	125.20
547	0.20°	119.60°	0.21' (2.52")	124.90
548	0.20°	128.90°	0.21' (2.52")	124.80
548	0.20°	122.00°	0.21' (2.52")	124.90
549	0.20°	129.60°	0.21' (2.52")	125.00
549	0.30°	136.00°	0.21' (2.52")	125.10
550	0.40°	120.50°	0.22' (2.64")	125.00
550	0.20°	118.00°	0.22' (2.64")	125.00
551	0.30°	093.00°	0.22' (2.64")	124.80
551	0.30°	129.50°	0.22' (2.64")	124.50
552	0.30°	109.70°	0.23' (2.76")	124.60
552	0.20°	152.20°	0.23' (2.76")	124.60
553	0.20°	120.70°	0.23' (2.76")	124.50
553	0.20°	155.50°	0.23' (2.76")	124.60
554	0.40°	104.50°	0.23' (2.76")	124.50

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Southwest Exploration Services, LLC

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DATA COMPUTATIONS

DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
554	0.20°	134.10°	0.24' (2.88")	124.40
555	0.20°	130.30°	0.24' (2.88")	124.50
555	0.30°	132.80°	0.24' (2.88")	124.60
556	0.20°	137.00°	0.24' (2.88")	124.50
556	0.20°	125.40°	0.24' (2.88")	124.60
557	0.20°	116.20°	0.24' (2.88")	124.60
557	0.40°	099.10°	0.25' (3.00")	124.50
558	0.30°	123.40°	0.25' (3.00")	124.30
558	0.50°	102.30°	0.25' (3.00")	124.10
559	0.50°	110.20°	0.26' (3.12")	123.80
559	0.50°	118.20°	0.26' (3.12")	123.60
560	0.30°	120.60°	0.27' (3.24")	123.60
560	0.30°	110.00°	0.27' (3.24")	123.50
561	0.30°	120.10°	0.27' (3.24")	123.50
561	0.20°	098.30°	0.27' (3.24")	123.40
562	0.30°	114.70°	0.27' (3.24")	123.30
562	0.40°	111.40°	0.28' (3.36")	123.30
563	0.30°	107.20°	0.28' (3.36")	123.10
563	0.30°	109.70°	0.28' (3.36")	122.90
564	0.30°	108.90°	0.29' (3.48")	122.90
564	0.30°	111.20°	0.29' (3.48")	122.80
565	0.20°	130.20°	0.29' (3.48")	122.90
565	0.20°	126.50°	0.29' (3.48")	122.90
566	0.20°	120.10°	0.29' (3.48")	122.90
566	0.20°	123.30°	0.29' (3.48")	123.00
567	0.30°	126.90°	0.30' (3.60")	123.10
567	0.30°	120.60°	0.30' (3.60")	123.00
568	0.40°	139.80°	0.30' (3.60")	123.00
568	0.30°	111.70°	0.30' (3.60")	123.10
569	0.20°	130.40°	0.31' (3.72")	123.10
569	0.20°	123.60°	0.31' (3.72")	123.10
570	0.30°	125.80°	0.31' (3.72")	123.20
570	0.20°	107.90°	0.31' (3.72")	123.10

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MEASURED DATA

DATA COMPUTATIONS

DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
571	0.20°	092.10°	0.31' (3.72")	123.00
571	0.20°	125.20°	0.31' (3.72")	122.80
572	0.30°	125.40°	0.32' (3.84")	122.90
572	0.40°	100.80°	0.32' (3.84")	122.70
573	0.30°	117.50°	0.32' (3.84")	122.50
573	0.30°	122.80°	0.33' (3.96")	122.50
574	0.30°	127.20°	0.33' (3.96")	122.50
574	0.30°	127.20°	0.33' (3.96")	122.60
575	0.30°	120.30°	0.33' (3.96")	122.70
575	0.40°	106.40°	0.34' (4.08")	122.60
576	0.40°	100.60°	0.34' (4.08")	122.30
576	0.30°	114.40°	0.34' (4.08")	122.20
577	0.30°	114.40°	0.35' (4.20")	122.20
577	0.40°	110.70°	0.35' (4.20")	122.10
578	0.30°	111.30°	0.35' (4.20")	122.00
578	0.50°	105.80°	0.35' (4.20")	121.80
579	0.20°	112.60°	0.36' (4.32")	121.70
579	0.50°	107.40°	0.36' (4.32")	121.60
580	0.40°	098.70°	0.36' (4.32")	121.40
580	0.50°	099.70°	0.37' (4.44")	121.20
581	0.30°	104.30°	0.37' (4.44")	121.00
581	0.40°	098.40°	0.37' (4.44")	121.00
582	0.40°	105.20°	0.38' (4.56")	120.80
582	0.20°	127.40°	0.38' (4.56")	120.90
583	0.30°	124.90°	0.38' (4.56")	120.90
583	0.20°	124.30°	0.38' (4.56")	120.90
584	0.30°	121.70°	0.39' (4.68")	120.80
584	0.20°	130.40°	0.39' (4.68")	120.80
585	0.30°	124.10°	0.39' (4.68")	120.80
585	0.20°	135.10°	0.39' (4.68")	120.80
586	0.30°	120.50°	0.40' (4.80")	120.80
586	0.30°	124.80°	0.40' (4.80")	120.70
587	0.30°	120.70°	0.40' (4.80")	120.70

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DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
587	0.20°	127.70°	0.40' (4.80")	120.70
588	0.20°	126.60°	0.40' (4.80")	120.70
588	0.30°	115.50°	0.41' (4.92")	120.70
589	0.40°	108.60°	0.41' (4.92")	120.60
589	0.40°	114.00°	0.41' (4.92")	120.50
590	0.50°	123.60°	0.42' (5.04")	120.50
590	0.40°	104.70°	0.42' (5.04")	120.50
591	0.40°	104.90°	0.42' (5.04")	120.30
591	0.50°	107.70°	0.43' (5.16")	120.30
592	0.30°	085.00°	0.43' (5.16")	120.10
592	0.50°	083.10°	0.43' (5.16")	119.90
593	0.40°	089.10°	0.44' (5.28")	119.70
593	0.50°	097.90°	0.44' (5.28")	119.50
594	0.30°	098.20°	0.44' (5.28")	119.30
594	0.30°	121.60°	0.44' (5.28")	119.20
595	0.30°	111.70°	0.45' (5.40")	119.20
595	0.30°	112.50°	0.45' (5.40")	119.20
596	0.30°	108.00°	0.45' (5.40")	119.10
596	0.40°	111.70°	0.45' (5.40")	119.10
597	0.50°	096.80°	0.46' (5.52")	119.00
597	0.40°	109.40°	0.46' (5.52")	118.80
598	0.40°	113.60°	0.47' (5.64")	118.80
598	0.50°	109.70°	0.47' (5.64")	118.70
599	0.30°	082.00°	0.47' (5.64")	118.50
599	0.70°	119.50°	0.48' (5.76")	118.50
600	0.30°	104.40°	0.48' (5.76")	118.40
600	0.20°	120.10°	0.48' (5.76")	118.40
601	0.40°	099.80°	0.49' (5.88")	118.40
601	0.30°	120.90°	0.49' (5.88")	118.40
602	0.20°	114.10°	0.49' (5.88")	118.30
602	0.30°	113.80°	0.49' (5.88")	118.30
603	0.30°	119.90°	0.50' (6.00")	118.30
603	0.30°	106.30°	0.50' (6.00")	118.30

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MEASURED DATA

DATA COMPUTATIONS

DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
604	0.30°	117.50°	0.50' (6.00")	118.30
604	0.20°	106.40°	0.50' (6.00")	118.30
605	0.20°	108.50°	0.50' (6.00")	118.30
605	0.40°	106.10°	0.51' (6.12")	118.20
606	0.40°	100.90°	0.51' (6.12")	118.10
606	0.40°	121.20°	0.51' (6.12")	118.10
607	0.20°	107.10°	0.52' (6.24")	118.10
607	0.20°	108.80°	0.52' (6.24")	118.10
608	0.20°	119.70°	0.52' (6.24")	118.10
608	0.30°	109.80°	0.52' (6.24")	118.10
609	0.30°	114.30°	0.53' (6.36")	118.10
609	0.30°	100.00°	0.53' (6.36")	118.00
610	0.20°	104.80°	0.53' (6.36")	118.00
610	0.40°	095.30°	0.53' (6.36")	117.90
611	0.50°	088.10°	0.53' (6.36")	117.60
611	0.20°	097.80°	0.54' (6.48")	117.50
612	0.40°	091.10°	0.54' (6.48")	117.40
612	0.30°	097.00°	0.54' (6.48")	117.20
613	0.30°	097.90°	0.55' (6.60")	117.10
613	0.30°	113.40°	0.55' (6.60")	117.00
614	0.20°	112.50°	0.55' (6.60")	117.00
614	0.20°	132.90°	0.55' (6.60")	117.00
615	0.30°	106.50°	0.55' (6.60")	117.10
615	0.40°	112.60°	0.56' (6.72")	117.00
616	0.30°	091.10°	0.56' (6.72")	117.00
616	0.50°	126.50°	0.56' (6.72")	117.00
617	0.30°	119.80°	0.57' (6.84")	117.00
617	0.40°	104.20°	0.57' (6.84")	116.90
618	0.50°	112.50°	0.57' (6.84")	116.90
618	0.40°	119.40°	0.58' (6.96")	116.80
619	0.40°	110.80°	0.58' (6.96")	116.80
619	0.40°	120.00°	0.58' (6.96")	116.80
620	0.30°	100.60°	0.59' (7.08")	116.70

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DATA COMPUTATIONS

DEPTHs, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
620	0.40°	099.10°	0.59' (7.08")	116.60
621	0.30°	100.70°	0.59' (7.08")	116.60
621	0.50°	098.50°	0.60' (7.20")	116.50
622	0.50°	090.50°	0.60' (7.20")	116.40
622	0.50°	082.20°	0.60' (7.20")	116.20
623	0.50°	074.20°	0.61' (7.32")	116.00
623	0.20°	056.20°	0.61' (7.32")	115.80
624	0.60°	073.00°	0.61' (7.32")	115.50
624	0.30°	058.70°	0.61' (7.32")	115.30
625	0.10°	063.50°	0.62' (7.44")	115.20
625	0.30°	066.30°	0.62' (7.44")	115.00
626	0.30°	060.20°	0.62' (7.44")	114.80
626	0.60°	066.00°	0.62' (7.44")	114.50
627	0.30°	061.80°	0.62' (7.44")	114.20
627	0.30°	060.10°	0.63' (7.56")	114.00
628	0.20°	058.00°	0.63' (7.56")	113.90
628	0.30°	058.10°	0.63' (7.56")	113.70
629	0.30°	057.70°	0.63' (7.56")	113.50
629	0.30°	070.80°	0.63' (7.56")	113.40
630	0.30°	054.60°	0.63' (7.56")	113.20
630	0.30°	044.80°	0.63' (7.56")	113.00
631	0.20°	062.10°	0.64' (7.68")	112.80
631	0.30°	057.70°	0.64' (7.68")	112.70
632	0.20°	047.60°	0.64' (7.68")	112.50
632	0.30°	052.80°	0.64' (7.68")	112.40
633	0.20°	043.60°	0.64' (7.68")	112.20
633	0.30°	047.60°	0.64' (7.68")	112.10
634	0.30°	055.80°	0.64' (7.68")	111.80
634	0.20°	042.20°	0.65' (7.80")	111.60
635	0.20°	043.50°	0.65' (7.80")	111.50
635	0.20°	035.80°	0.65' (7.80")	111.40
636	0.20°	051.60°	0.65' (7.80")	111.30
636	0.30°	042.10°	0.65' (7.80")	111.10

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MEASURED DATA

DATA COMPUTATIONS

DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
637	0.30°	054.40°	0.65' (7.80")	110.90
637	0.30°	056.20°	0.65' (7.80")	110.60
638	0.20°	030.10°	0.65' (7.80")	110.50
638	0.20°	037.00°	0.65' (7.80")	110.40
639	0.20°	046.30°	0.65' (7.80")	110.30
639	0.30°	041.50°	0.65' (7.80")	110.10
640	0.20°	068.70°	0.66' (7.92")	110.00
640	0.30°	057.90°	0.66' (7.92")	109.80
641	0.40°	089.50°	0.66' (7.92")	109.70
641	0.30°	051.50°	0.66' (7.92")	109.50
642	0.30°	067.50°	0.66' (7.92")	109.30
642	0.20°	043.30°	0.66' (7.92")	109.20
643	0.30°	053.10°	0.67' (8.04")	109.10
643	0.20°	049.10°	0.67' (8.04")	108.90
644	0.20°	032.20°	0.67' (8.04")	108.80
644	0.20°	067.50°	0.67' (8.04")	108.70
645	0.20°	035.20°	0.67' (8.04")	108.60
645	0.20°	038.50°	0.67' (8.04")	108.50
646	0.30°	051.40°	0.67' (8.04")	108.40
646	0.30°	028.50°	0.67' (8.04")	108.20
647	0.20°	022.80°	0.67' (8.04")	108.00
647	0.20°	050.90°	0.67' (8.04")	107.80
648	0.30°	050.70°	0.68' (8.16")	107.70
648	0.20°	029.20°	0.68' (8.16")	107.60
649	0.30°	058.20°	0.68' (8.16")	107.40
649	0.20°	040.90°	0.68' (8.16")	107.30
650	0.20°	031.30°	0.68' (8.16")	107.20
650	0.30°	062.10°	0.68' (8.16")	107.00
651	0.30°	035.50°	0.68' (8.16")	106.90
651	0.20°	055.30°	0.68' (8.16")	106.70
652	0.20°	020.40°	0.68' (8.16")	106.50
652	0.30°	061.40°	0.69' (8.28")	106.40
653	0.30°	059.40°	0.69' (8.28")	106.30

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True Vertical Depth: 1217.75'

Final Drift Distance: 3.54' (42.48")

Final Drift Bearing: 149.10°

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MEASURED DATA

DATA COMPUTATIONS

DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
653	0.20°	023.90°	0.69' (8.28")	106.20
654	0.20°	021.00°	0.69' (8.28")	106.10
654	0.20°	054.10°	0.69' (8.28")	105.90
655	0.30°	054.10°	0.69' (8.28")	105.80
655	0.30°	049.80°	0.69' (8.28")	105.60
656	0.20°	045.20°	0.69' (8.28")	105.50
656	0.30°	036.30°	0.69' (8.28")	105.30
657	0.10°	034.10°	0.69' (8.28")	105.20
657	0.30°	057.70°	0.70' (8.40")	105.10
658	0.20°	031.10°	0.70' (8.40")	104.90
658	0.20°	034.00°	0.70' (8.40")	104.80
659	0.30°	052.10°	0.70' (8.40")	104.70
659	0.40°	037.20°	0.70' (8.40")	104.50
660	0.30°	056.40°	0.70' (8.40")	104.30
660	0.20°	040.50°	0.70' (8.40")	104.10
661	0.30°	022.40°	0.70' (8.40")	104.00
661	0.30°	047.60°	0.70' (8.40")	103.80
662	0.20°	030.30°	0.71' (8.52")	103.60
662	0.10°	023.20°	0.71' (8.52")	103.50
663	0.30°	027.90°	0.71' (8.52")	103.40
663	0.20°	043.70°	0.71' (8.52")	103.20
664	0.20°	058.50°	0.71' (8.52")	103.10
664	0.30°	045.80°	0.71' (8.52")	102.90
665	0.30°	038.00°	0.71' (8.52")	102.80
665	0.40°	048.50°	0.71' (8.52")	102.60
666	0.40°	047.50°	0.71' (8.52")	102.30
666	0.50°	049.30°	0.72' (8.64")	102.10
667	0.40°	053.00°	0.72' (8.64")	101.80
667	0.30°	038.90°	0.72' (8.64")	101.70
668	0.40°	062.00°	0.72' (8.64")	101.50
668	0.90°	035.70°	0.73' (8.76")	101.10
669	0.30°	035.50°	0.73' (8.76")	100.70
669	0.50°	045.50°	0.73' (8.76")	100.50

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True Vertical Depth: 1217.75'

Final Drift Distance: 3.54' (42.48")

Final Drift Bearing: 149.10°

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MEASURED DATA

DATA COMPUTATIONS

DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
670	0.60°	071.60°	0.73' (8.76")	100.30
670	0.30°	037.00°	0.74' (8.88")	100.10
671	0.20°	063.00°	0.74' (8.88")	100.00
671	0.10°	084.10°	0.74' (8.88")	099.90
672	0.30°	068.40°	0.74' (8.88")	099.90
672	0.30°	087.90°	0.74' (8.88")	099.80
673	0.30°	074.50°	0.75' (9.00")	099.70
673	0.20°	015.00°	0.75' (9.00")	099.60
674	0.20°	053.60°	0.75' (9.00")	099.50
674	0.30°	065.00°	0.75' (9.00")	099.40
675	0.30°	054.10°	0.75' (9.00")	099.30
675	0.30°	046.60°	0.75' (9.00")	099.20
676	0.30°	054.40°	0.75' (9.00")	099.00
676	0.20°	049.30°	0.76' (9.12")	098.90
677	0.30°	048.70°	0.76' (9.12")	098.80
677	0.20°	053.70°	0.76' (9.12")	098.70
678	0.20°	032.20°	0.76' (9.12")	098.60
678	0.30°	042.10°	0.76' (9.12")	098.50
679	0.30°	040.30°	0.76' (9.12")	098.30
679	0.20°	028.00°	0.76' (9.12")	098.10
680	0.20°	056.50°	0.76' (9.12")	098.00
680	0.20°	049.00°	0.77' (9.24")	098.00
681	0.30°	035.90°	0.77' (9.24")	097.80
681	0.30°	061.60°	0.77' (9.24")	097.70
682	0.20°	036.10°	0.77' (9.24")	097.50
682	0.30°	044.20°	0.77' (9.24")	097.40
683	0.20°	014.90°	0.77' (9.24")	097.20
683	0.20°	068.30°	0.77' (9.24")	097.10
684	0.40°	029.60°	0.77' (9.24")	097.00
684	0.20°	027.10°	0.77' (9.24")	096.80
685	0.30°	039.60°	0.78' (9.36")	096.70
685	0.30°	058.60°	0.78' (9.36")	096.50
686	0.20°	035.50°	0.78' (9.36")	096.40

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Southwest Exploration Services, LLC

(480) 926-4558

R-09

MEASURED DATA

DATA COMPUTATIONS

DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
686	0.20°	022.60°	0.78' (9.36")	096.30
687	0.10°	041.10°	0.78' (9.36")	096.20
687	0.30°	029.60°	0.78' (9.36")	096.10
688	0.20°	028.00°	0.78' (9.36")	096.00
688	0.20°	048.80°	0.78' (9.36")	095.80
689	0.30°	032.40°	0.78' (9.36")	095.70
689	0.30°	038.60°	0.79' (9.48")	095.50
690	0.20°	017.80°	0.79' (9.48")	095.40
690	0.30°	024.90°	0.79' (9.48")	095.20
691	0.30°	029.40°	0.79' (9.48")	095.10
691	0.40°	062.80°	0.79' (9.48")	094.90
692	0.20°	072.70°	0.79' (9.48")	094.80
692	0.30°	024.20°	0.79' (9.48")	094.70
693	0.20°	037.90°	0.79' (9.48")	094.60
693	0.30°	036.80°	0.79' (9.48")	094.50
694	0.30°	057.40°	0.80' (9.60")	094.30
694	0.20°	031.70°	0.80' (9.60")	094.20
695	0.30°	068.00°	0.80' (9.60")	094.10
695	0.50°	076.40°	0.80' (9.60")	094.10
696	0.30°	061.00°	0.81' (9.72")	094.00
696	0.10°	048.30°	0.81' (9.72")	093.90
697	0.20°	052.00°	0.81' (9.72")	093.80
697	0.20°	066.70°	0.81' (9.72")	093.80
698	0.10°	057.90°	0.81' (9.72")	093.70
698	0.30°	065.10°	0.81' (9.72")	093.60
699	0.30°	038.80°	0.81' (9.72")	093.50
699	0.20°	036.40°	0.81' (9.72")	093.30
700	0.20°	043.00°	0.82' (9.84")	093.20
700	0.20°	039.50°	0.82' (9.84")	093.10
701	0.20°	047.20°	0.82' (9.84")	093.10
701	0.30°	085.90°	0.82' (9.84")	093.00
702	0.20°	045.60°	0.82' (9.84")	093.00
702	0.20°	069.50°	0.82' (9.84")	092.90

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

R-09

MEASURED DATA

DATA COMPUTATIONS

DEPTHs, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
703	0.30°	076.70°	0.82' (9.84")	092.80
703	0.30°	057.30°	0.83' (9.96")	092.70
704	0.20°	099.90°	0.83' (9.96")	092.70
704	0.20°	048.50°	0.83' (9.96")	092.60
705	0.30°	049.90°	0.83' (9.96")	092.50
705	0.30°	071.00°	0.83' (9.96")	092.50
706	0.40°	071.40°	0.84' (10.08")	092.40
706	0.20°	054.80°	0.84' (10.08")	092.30
707	0.20°	023.80°	0.84' (10.08")	092.20
707	0.40°	038.00°	0.84' (10.08")	092.10
708	0.20°	033.50°	0.84' (10.08")	092.00
708	0.30°	053.10°	0.84' (10.08")	091.90
709	0.20°	035.80°	0.85' (10.20")	091.70
709	0.30°	044.90°	0.85' (10.20")	091.60
710	0.30°	042.40°	0.85' (10.20")	091.50
710	0.30°	048.90°	0.85' (10.20")	091.40
711	0.20°	031.50°	0.85' (10.20")	091.20
711	0.20°	038.60°	0.85' (10.20")	091.10
712	0.20°	049.50°	0.85' (10.20")	091.10
712	0.30°	059.30°	0.86' (10.32")	091.00
713	0.20°	063.80°	0.86' (10.32")	090.90
713	0.30°	036.60°	0.86' (10.32")	090.80
714	0.30°	057.30°	0.86' (10.32")	090.70
714	0.50°	078.00°	0.87' (10.44")	090.70
715	0.30°	077.00°	0.87' (10.44")	090.60
715	0.30°	069.70°	0.87' (10.44")	090.50
716	0.40°	059.80°	0.87' (10.44")	090.40
716	0.40°	063.30°	0.88' (10.56")	090.30
717	0.40°	053.90°	0.88' (10.56")	090.20
717	0.30°	051.50°	0.88' (10.56")	090.10
718	0.30°	068.30°	0.88' (10.56")	090.00
718	0.20°	038.40°	0.89' (10.68")	089.90
719	0.20°	063.70°	0.89' (10.68")	089.90

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

R-09

MEASURED DATA

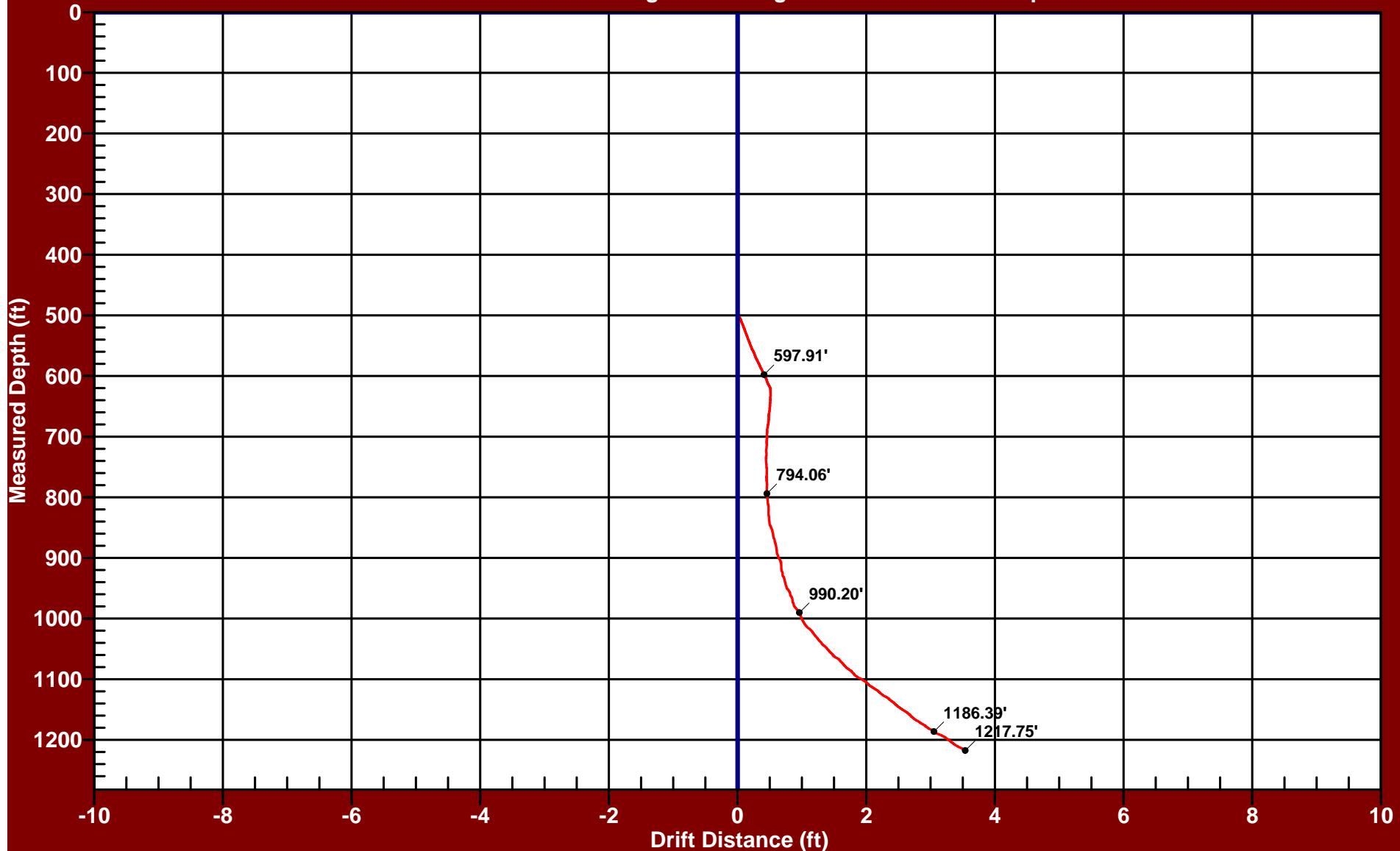
DATA COMPUTATIONS

DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	DRIFT DIST., feet	DRIFT BRG., degrees
719	0.10°	316.50°	0.89' (10.68")	089.80
720	0.10°	052.00°	0.89' (10.68")	089.80
720	0.20°	047.80°	0.89' (10.68")	089.70
721	0.00°	326.00°	0.89' (10.68")	089.60
721	0.00°	341.30°	0.89' (10.68")	089.60
722	0.10°	071.20°	0.89' (10.68")	089.60
722	0.10°	345.90°	0.89' (10.68")	089.60
723	0.00°	012.80°	0.89' (10.68")	089.50
723	0.10°	050.00°	0.89' (10.68")	089.50
724	0.10°	005.00°	0.89' (10.68")	089.50
724	0.10°	307.30°	0.89' (10.68")	089.40
725	0.10°	345.20°	0.89' (10.68")	089.40
725	0.10°	025.10°	0.89' (10.68")	089.30
726	0.10°	289.40°	0.89' (10.68")	089.30
726	0.00°	199.90°	0.89' (10.68")	089.20
727	0.30°	053.90°	0.89' (10.68")	089.20
727	0.10°	321.20°	0.89' (10.68")	089.10
728	0.20°	073.50°	0.89' (10.68")	089.10
728	0.00°	318.70°	0.89' (10.68")	089.00
729	0.10°	008.70°	0.89' (10.68")	089.00
729	0.10°	086.80°	0.89' (10.68")	089.00
730	0.00°	304.10°	0.89' (10.68")	089.00
730	0.10°	038.90°	0.89' (10.68")	089.00
731	0.20°	130.40°	0.90' (10.80")	089.10
731	0.20°	075.40°	0.90' (10.80")	089.10
732	0.10°	317.00°	0.90' (10.80")	089.00
732	0.00°	360.00°	0.90' (10.80")	089.00
733	0.00°	360.00°	0.90' (10.80")	089.00
733	0.10°	185.70°	0.90' (10.80")	089.00
734	0.10°	295.70°	0.90' (10.80")	089.00
734	0.00°	271.80°	0.90' (10.80")	089.00
735	0.00°	360.00°	0.90' (10.80")	089.00
735	0.20°	282.20°	0.90' (10.80")	089.00

PLANE OF DRIFT VIEW - R-09

HYDRO RESOURCES
FLORENCE COPPER

Drift Distance = 3.54 Feet Drift Bearing = 149.1 Degrees True Vertical Depth = 1217.75 Feet



Date of Survey: Friday - March 9, 2018

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - R-09

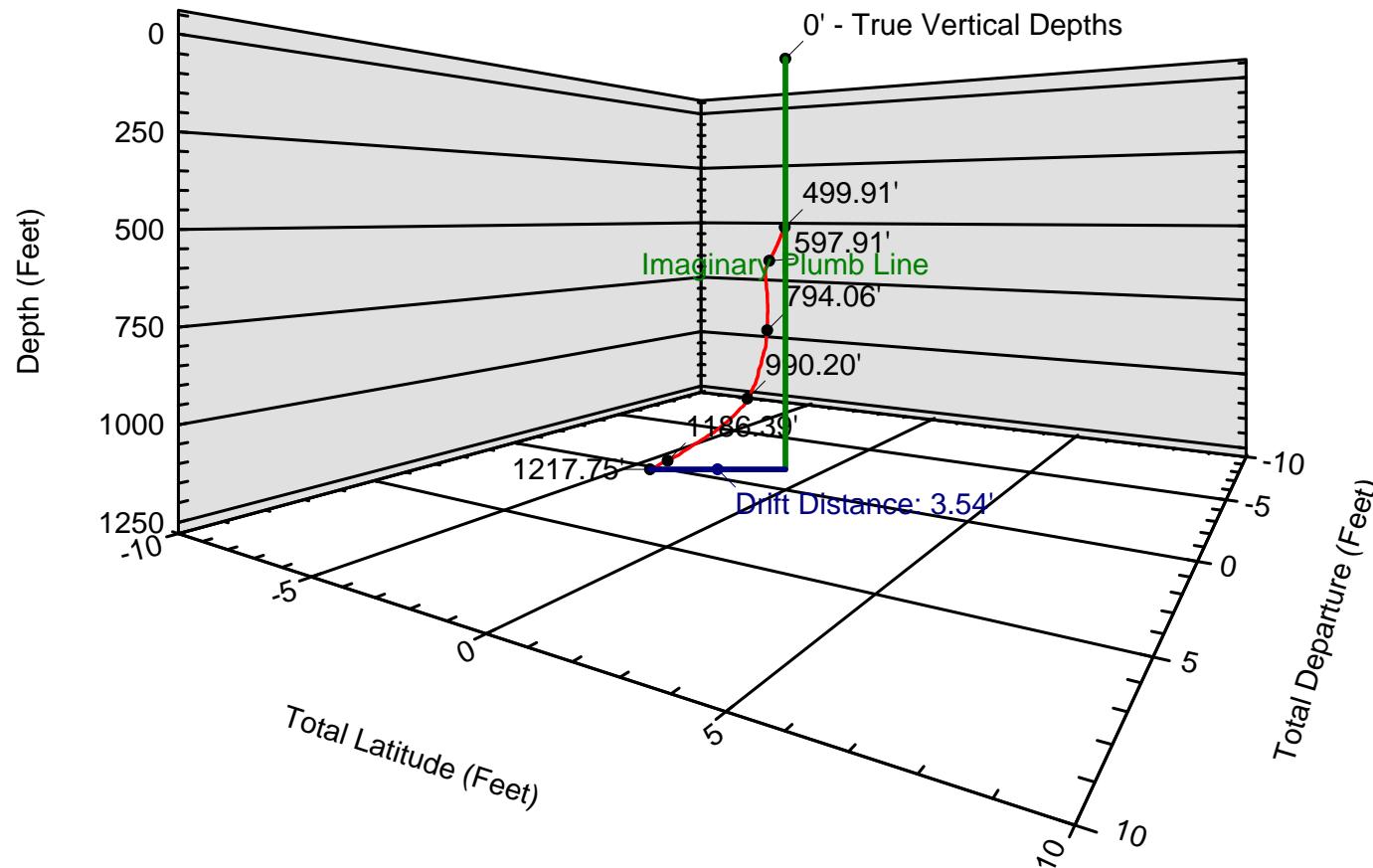
HYDRO RESOURCES
FLORENCE COPPER

Drift Distance = 3.54 Feet

Drift Bearing = 149.1 Degrees

True Vertical Depth = 1217.75 Feet

301.0



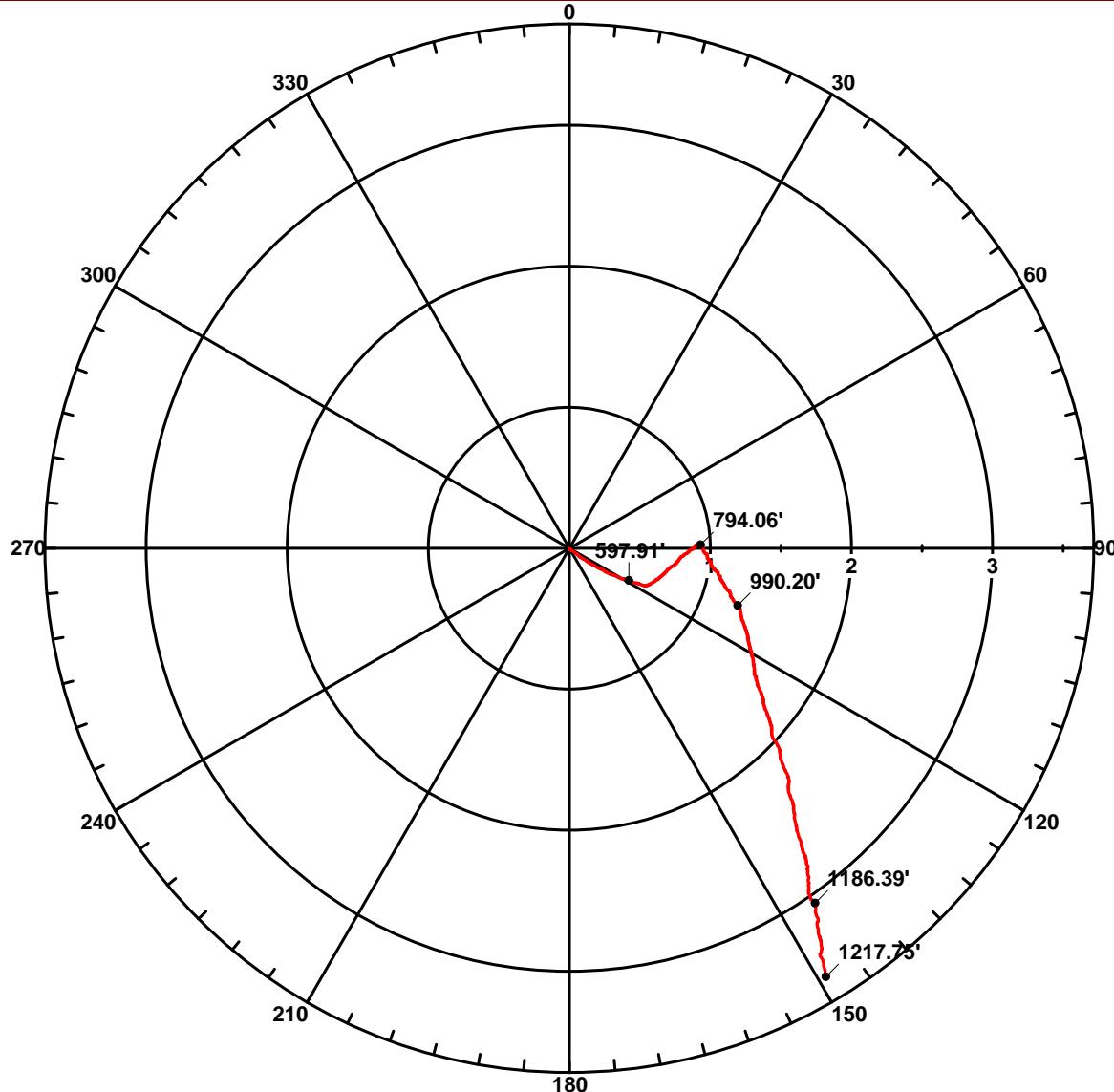
Date of Survey: Friday - March 9, 2018

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - R-09
HYDRO RESOURCES
FLORENCE COPPER

Drift Distance = 3.54 Feet Drift Bearing = 149.1 Degrees True Vertical Depth = 1217.75 Feet



Date of Survey: Friday - March 9, 2018

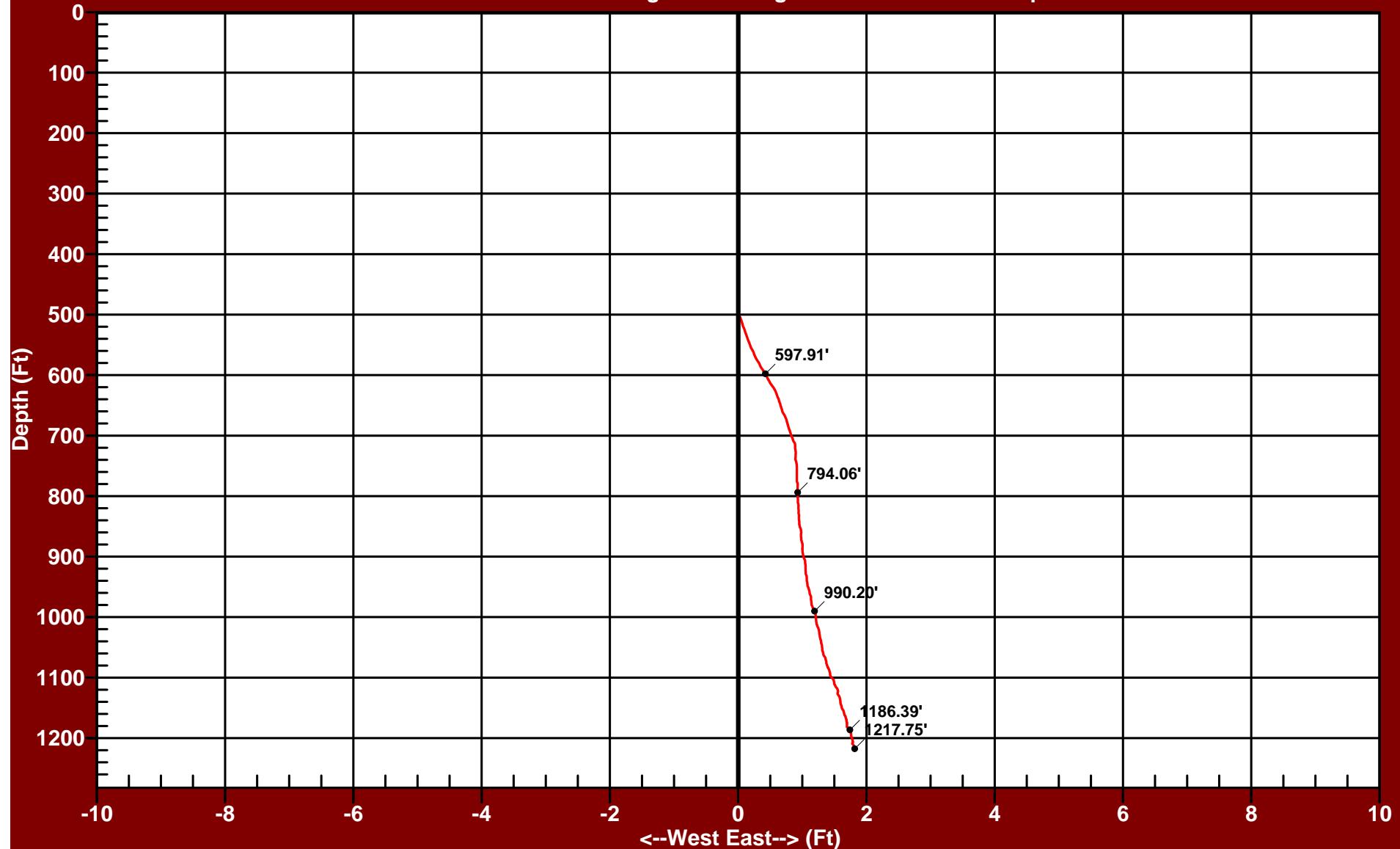
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

EASTING RECTANGULAR VIEW - R-09

HYDRO RESOURCES
FLORENCE COPPER

Drift Distance = 3.54 Feet Drift Bearing = 149.1 Degrees True Vertical Depth = 1217.75 Feet



Date of Survey: Friday - March 9, 2018

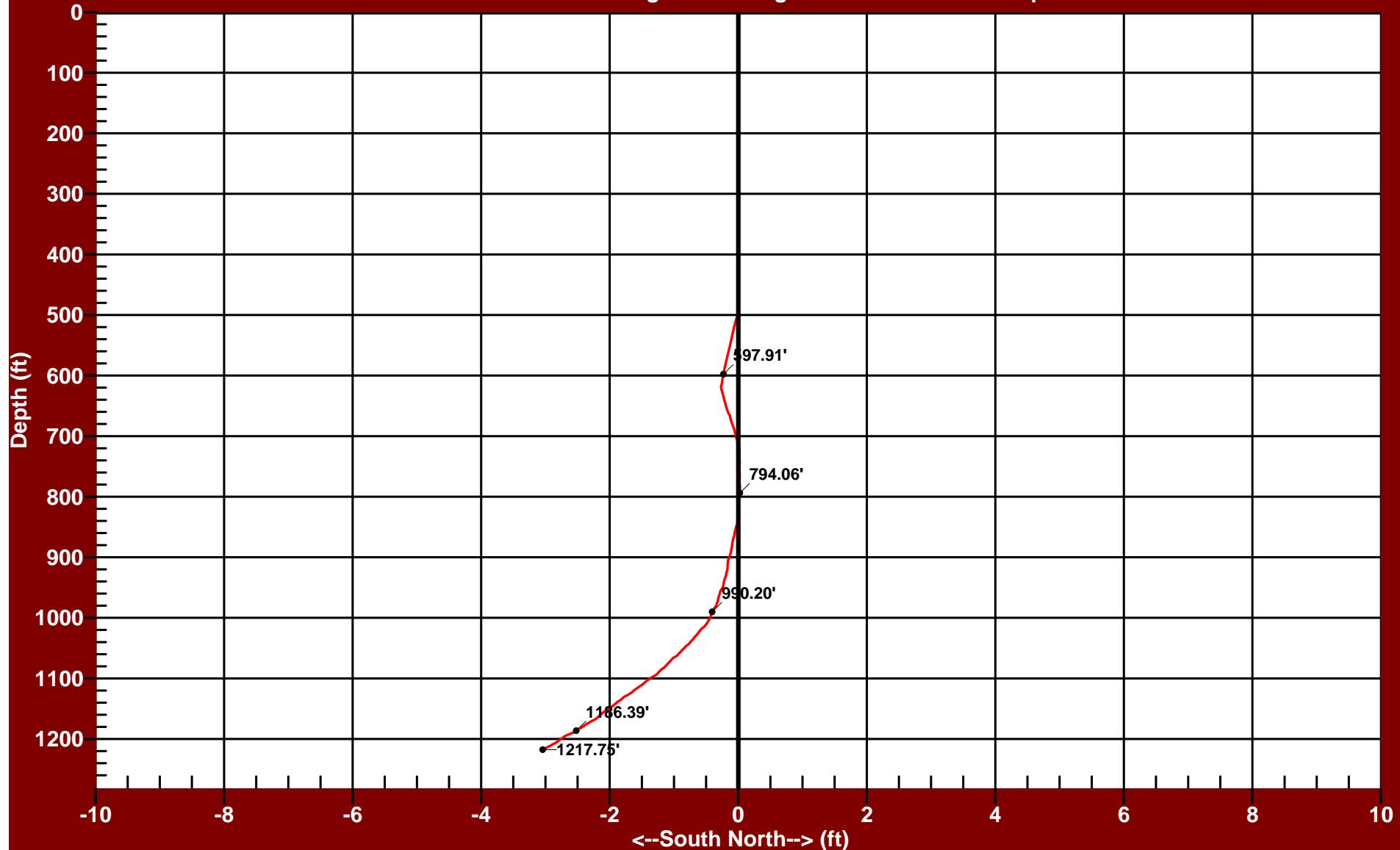
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

NORTHING RECTANGULAR VIEW - R-09

HYDRO RESOURCES
FLORENCE COPPER

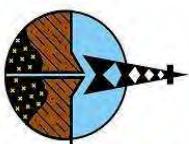
Drift Distance = 3.54 Feet Drift Bearing = 149.1 Degrees True Vertical Depth = 1217.75 Feet



Date of Survey: Friday - March 9, 2018

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER		
WELL ID	R-09		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: GAMMA - CALIPER			
MORE: TEMP./FLUID RES.			
LOCATION	OTHER SERVICES SONIC 4 PI DENSITY DUAL DENSITY		
SEC	TWP	RGE	ELEVATION K.B. D.F. G.L.
PERMANENT DATUM	GROUND LEVEL	ABOVE PERM. DATUM	
LOG MEAS. FROM	DRILLING MEAS. FROM GROUND LEVEL		
DATE	4-26-18	TYPE FLUID IN HOLE MUD WEIGHT	FORMATION WATER N/A
RUN No	1	VISCOSITY	N/A
TYPE LOG	GAMMA - CALIPER - TFR	DEPTH-DRILLER	1200 FT.
DEPTH-LOGGER	1185 FT.	MAX. REC. TEMP.	28.97 DEG. C
BTM LOGGED INTERVAL	1185 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	A. OLSON	TOOL STRING/SN	MSI COMBO TOOL SN 4183
WITNESSED BY	COLLIN - H&A	LOG TIME: ON SITE/OFF SITE	6:20 A.M.
RUN	BOREHOLE RECORD	CASING RECORD	
NO.	BIT	FROM	TO
1	?	SURFACE	40 FT.
2	22 IN.	40 FT.	500 FT.
3	14 IN.	500 FT.	TOTAL DEPTH
COMMENTS:			

Tool Summary:					
Date	4-26-18	Date	4-26-18	Date	4-26-18
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	ALT 4 RX SONIC	Tool Model	COMPROBE 4 PI
Tool SN	4183	Tool SN	4572	Tool SN	6009
From	SURFACE	From	200 FT.	From	SURFACE
To	1185 FT.	To	1185 FT.	To	1185 FT.
Recorded By	A. OLSON	Recorded By	A. OLSON	Recorded By	A. OLSON
Truck No	900	Truck No	900	Truck No	900
Operation Check	4-25-18	Operation Check	4-25-18	Operation Check	4-25-18
Calibration Check	4-25-18	Calibration Check	N/A	Calibration Check	N/A
Time Logged	6:40 A.M.	Time Logged	7:40 A.M.	Time Logged	8:45 A.M.

Date	4-26-18	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	ALT QL DENSITY	Tool Model		Tool Model	
Tool SN	6187	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1185 FT.	To		To	
Recorded By	A. OLSON	Recorded By		Recorded By	
Truck No	900	Truck No		Truck No	
Operation Check	4-25-18	Operation Check		Operation Check	
Calibration Check	N/A	Calibration Check		Calibration Check	
Time Logged	9:30 A.M.	Time Logged		Time Logged	

Additional Comments:

Caliper Arms Used: 9 IN.

Calibration Points: 4 IN. & 12 IN.

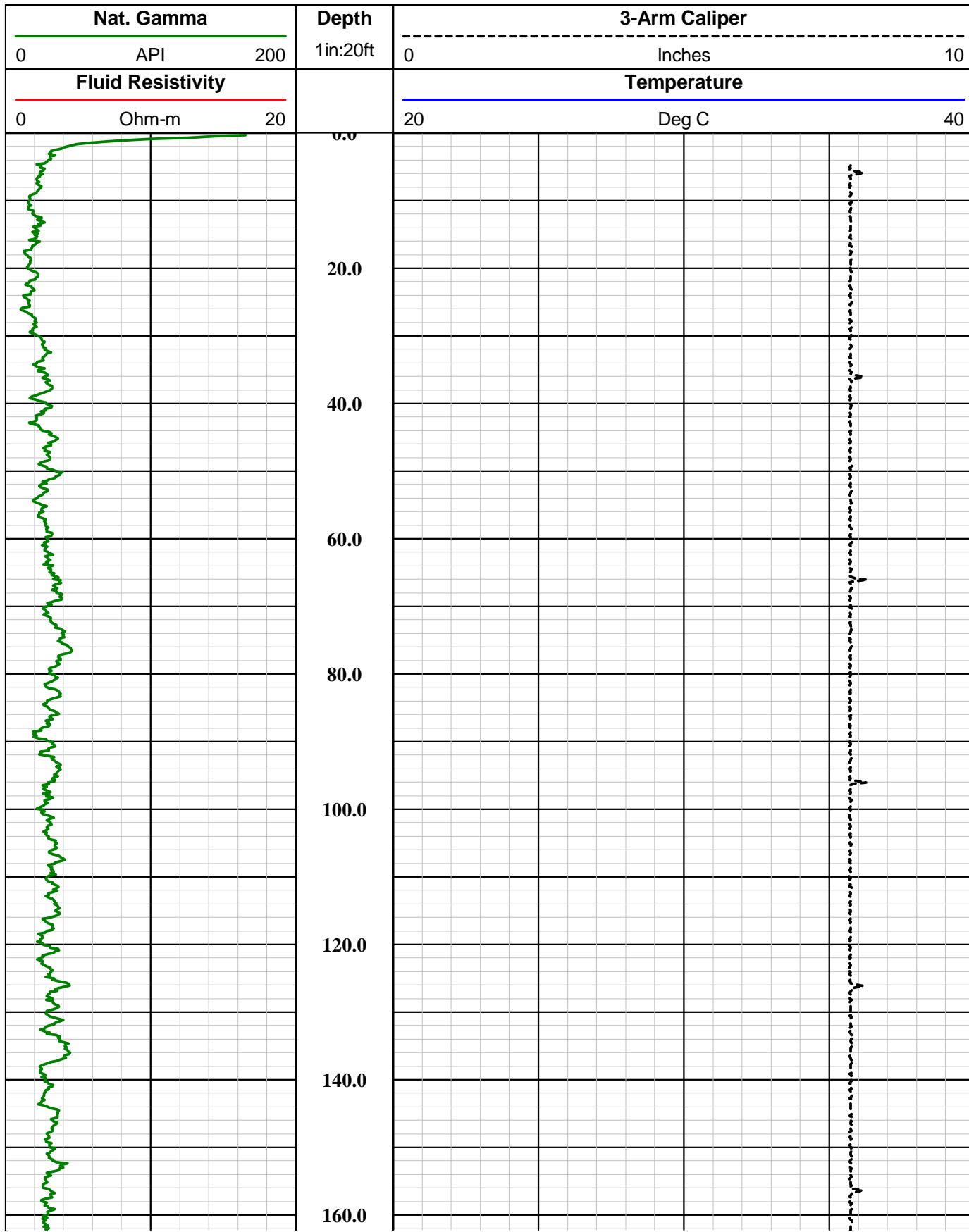
Calibration Points: N/A

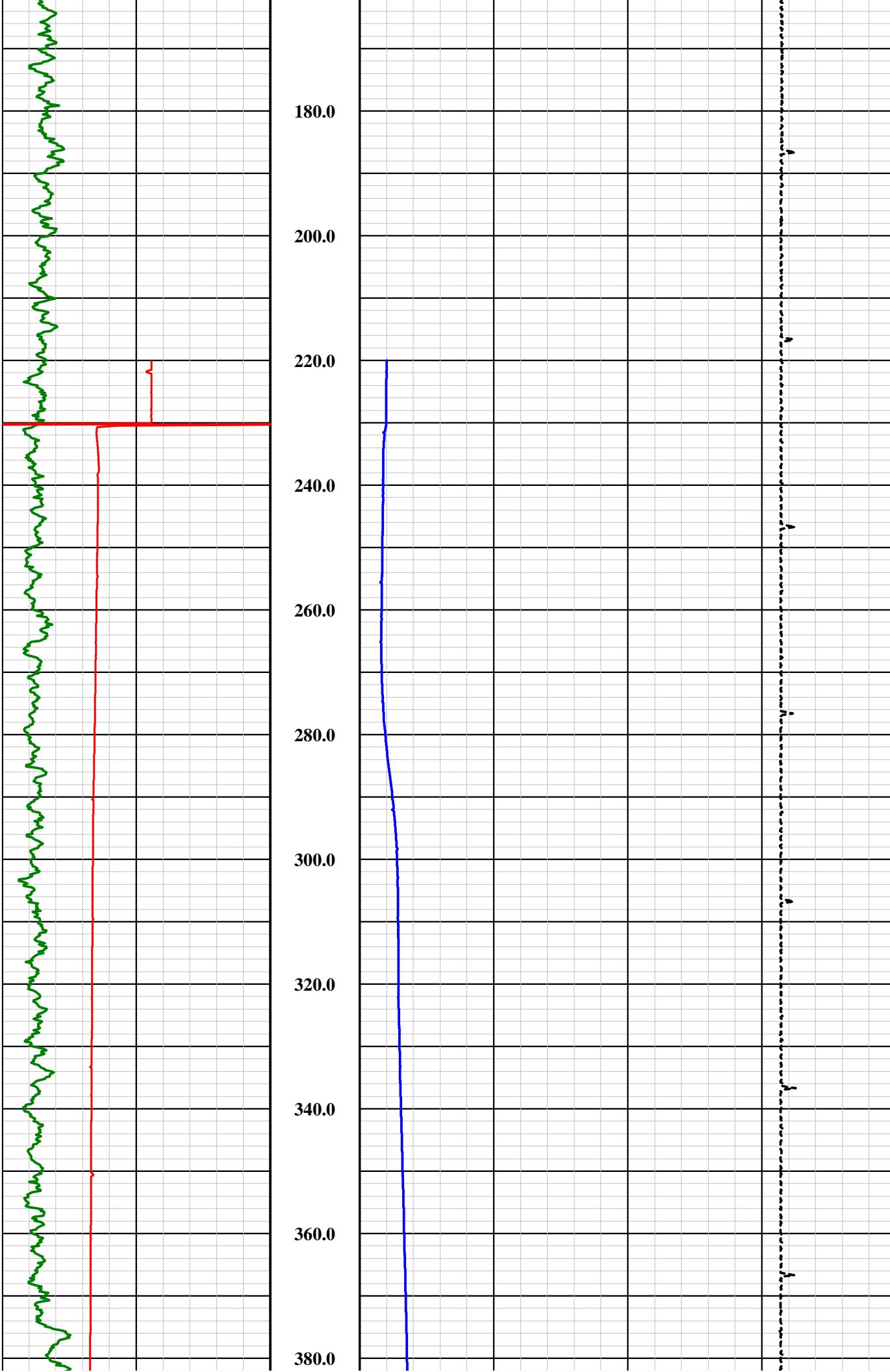
E-Log Calibration Range: N/A

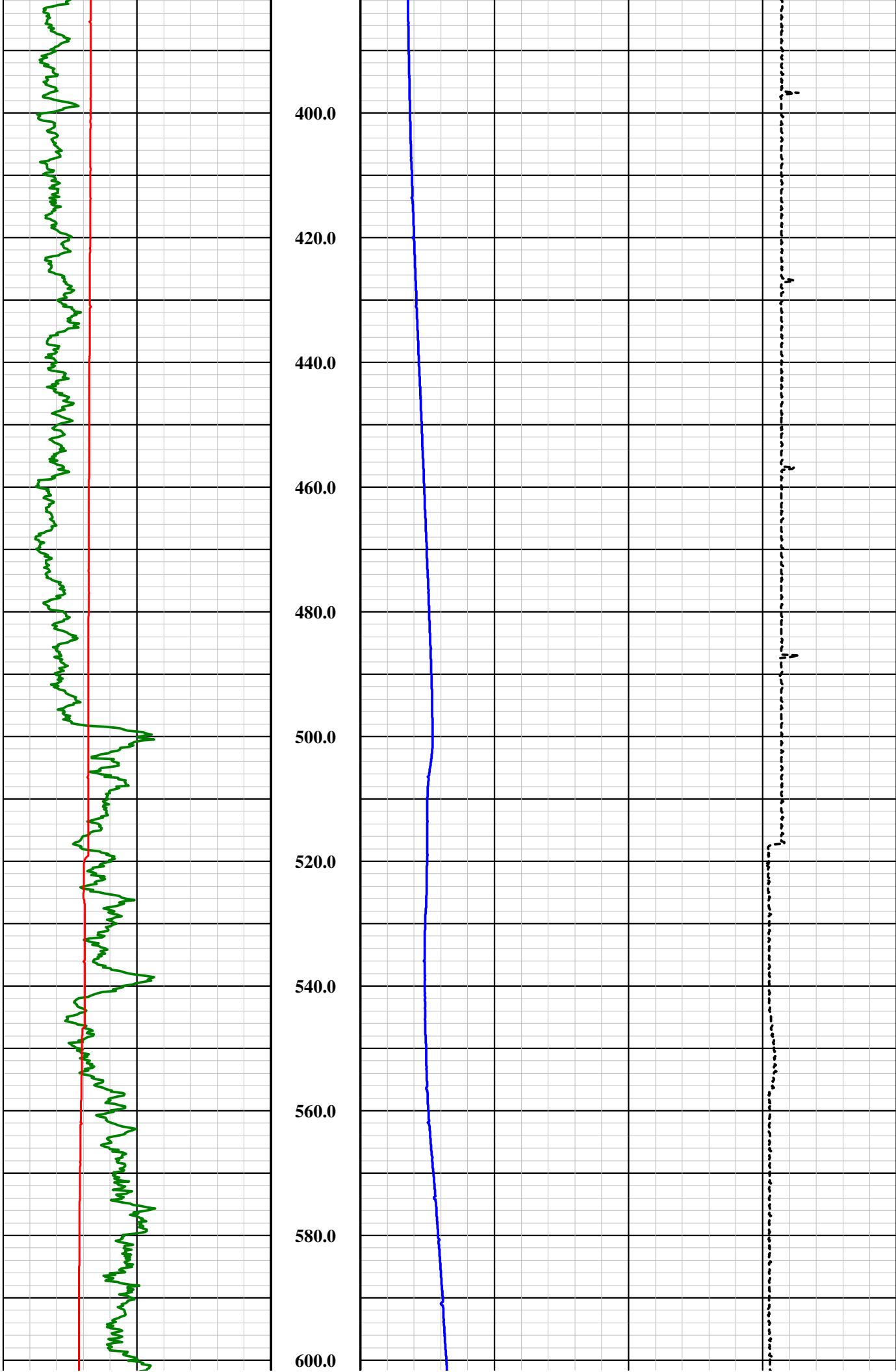
Calibration Points: N/A

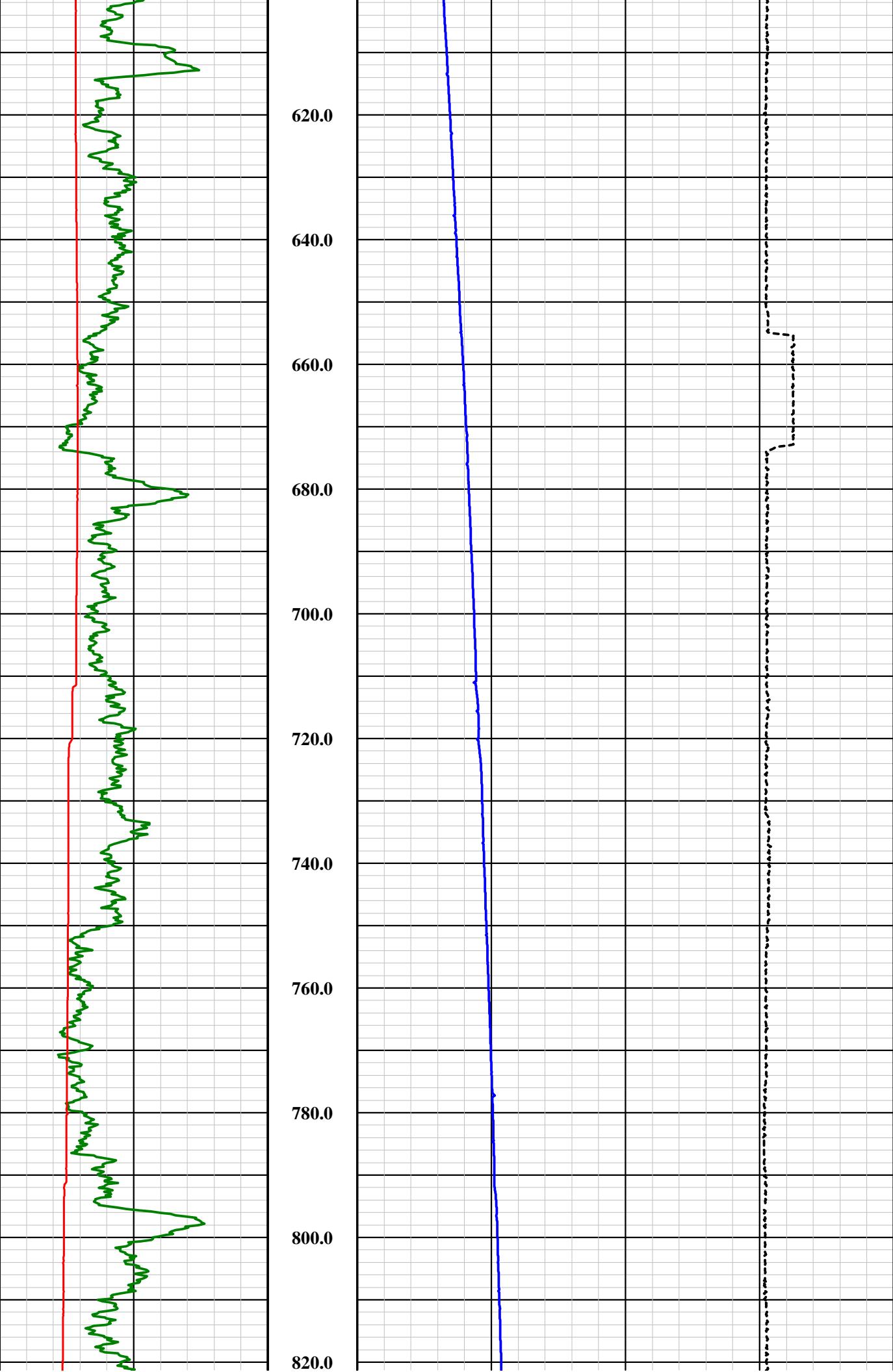
Disclaimer:

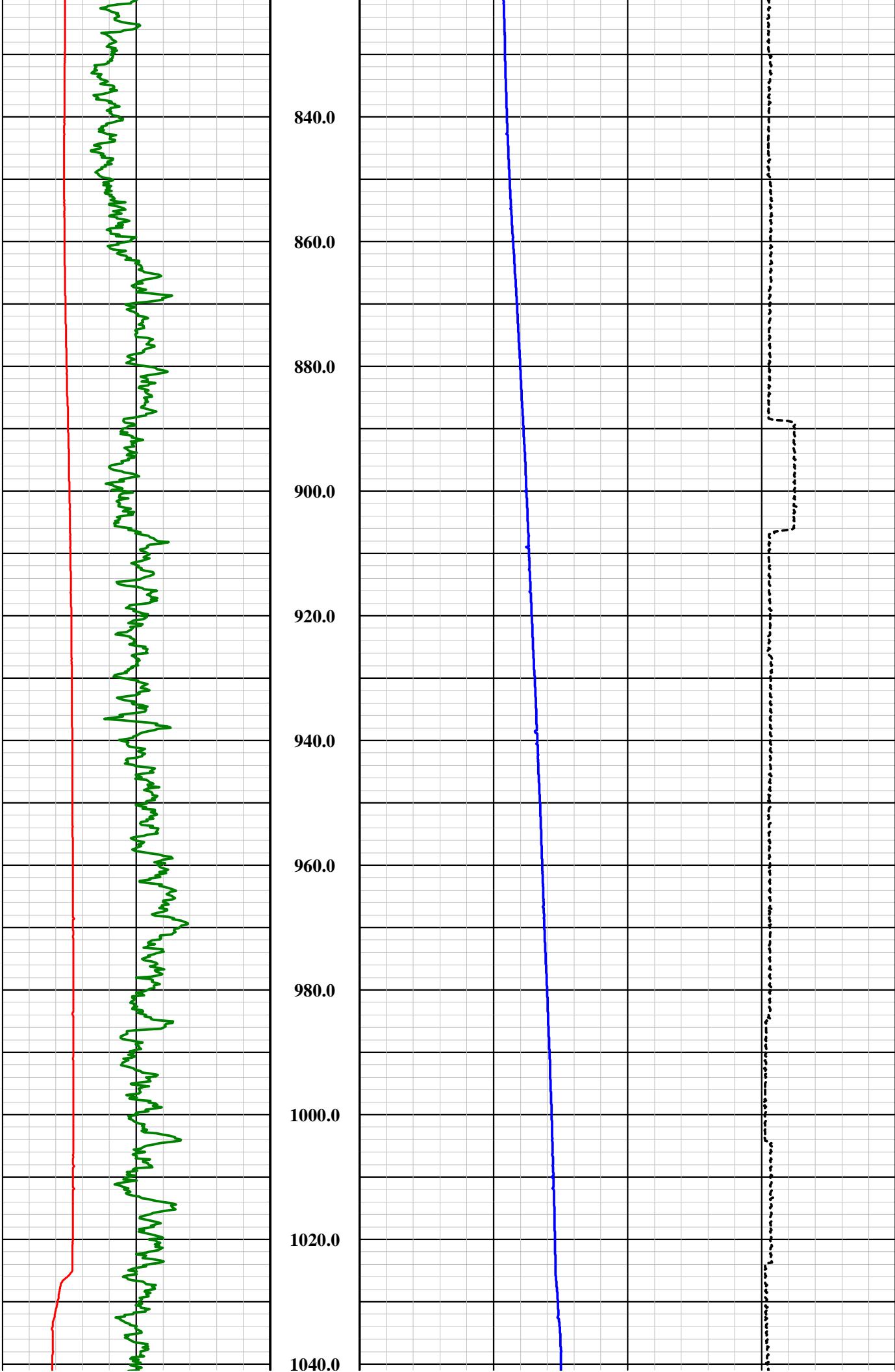
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

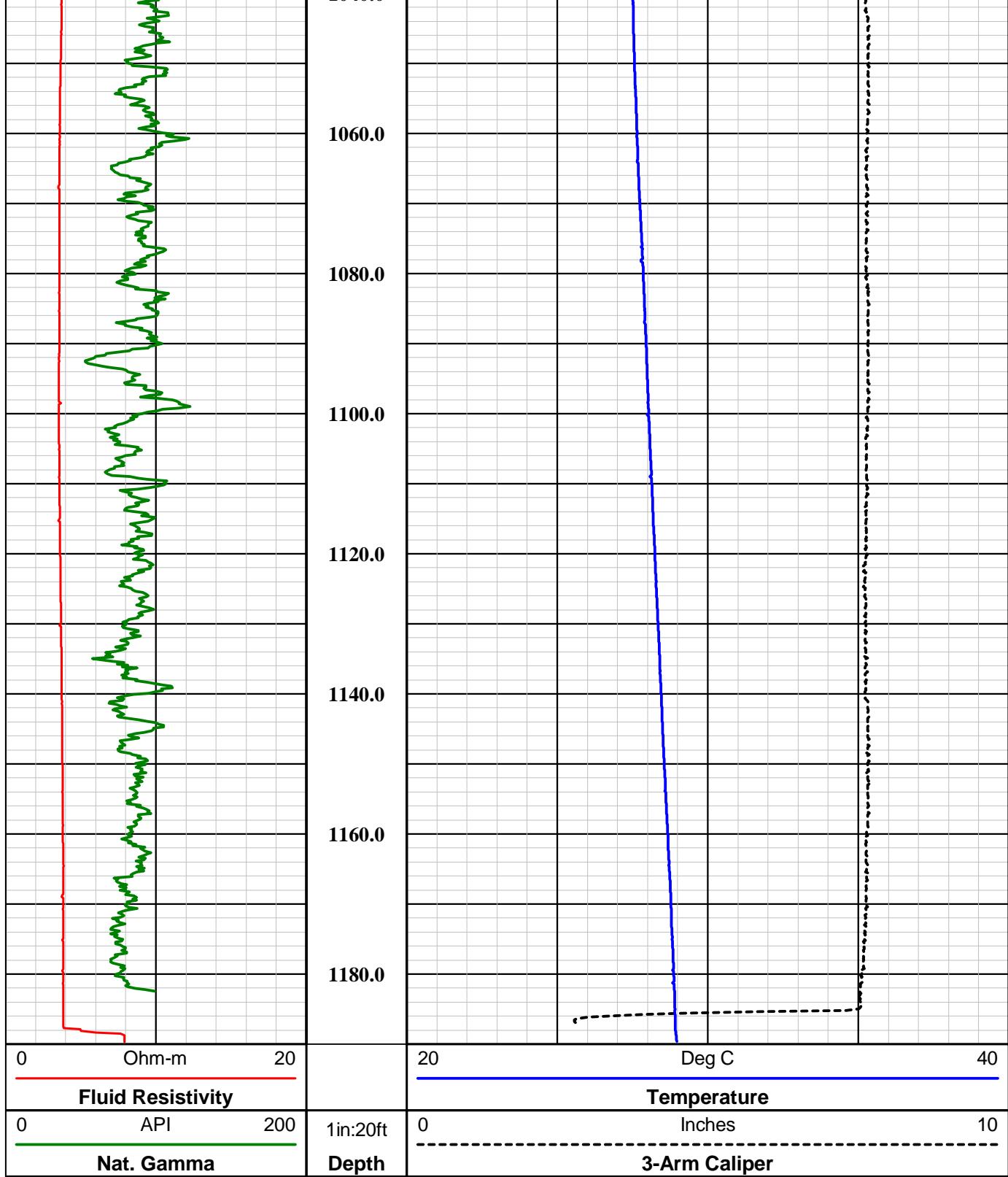












MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

— **Natural Gamma Ray = 0.76 m (29.75 in)**

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

— **3-Arm Caliper = 1.44 m (56.75 in)**

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

— **TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)**

1.375" or 34.9 mm Diameter



**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	R-09
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA



APPENDIX F

Cement Bond Log Summary

WELL R-09

Geophysical Log Summary

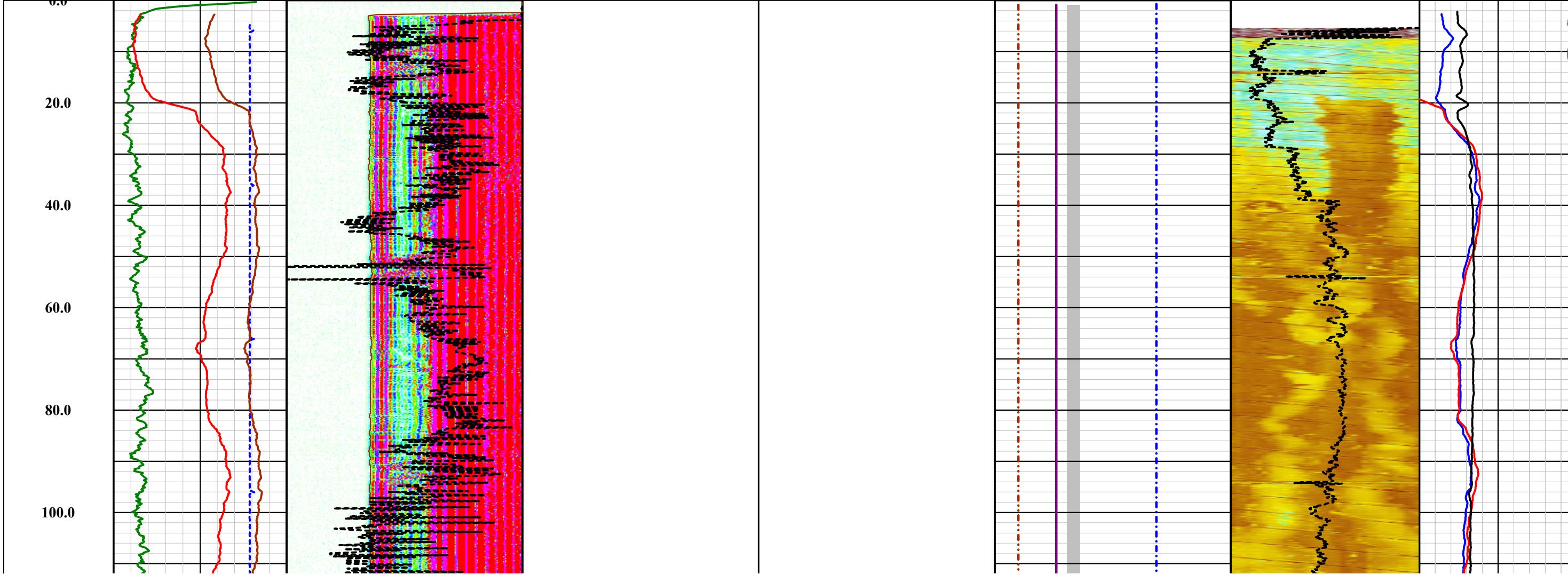
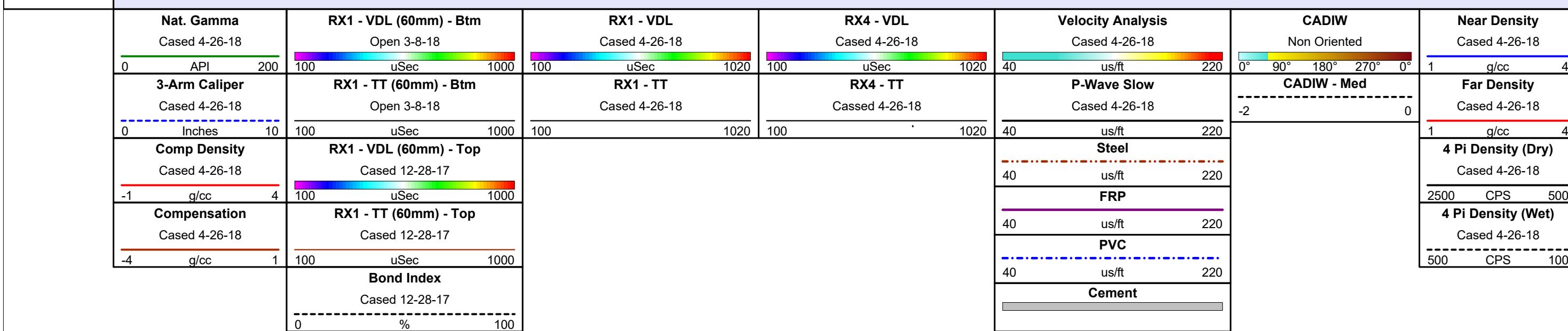

Southwest Exploration Services, LLC
 borehole geophysics & video services

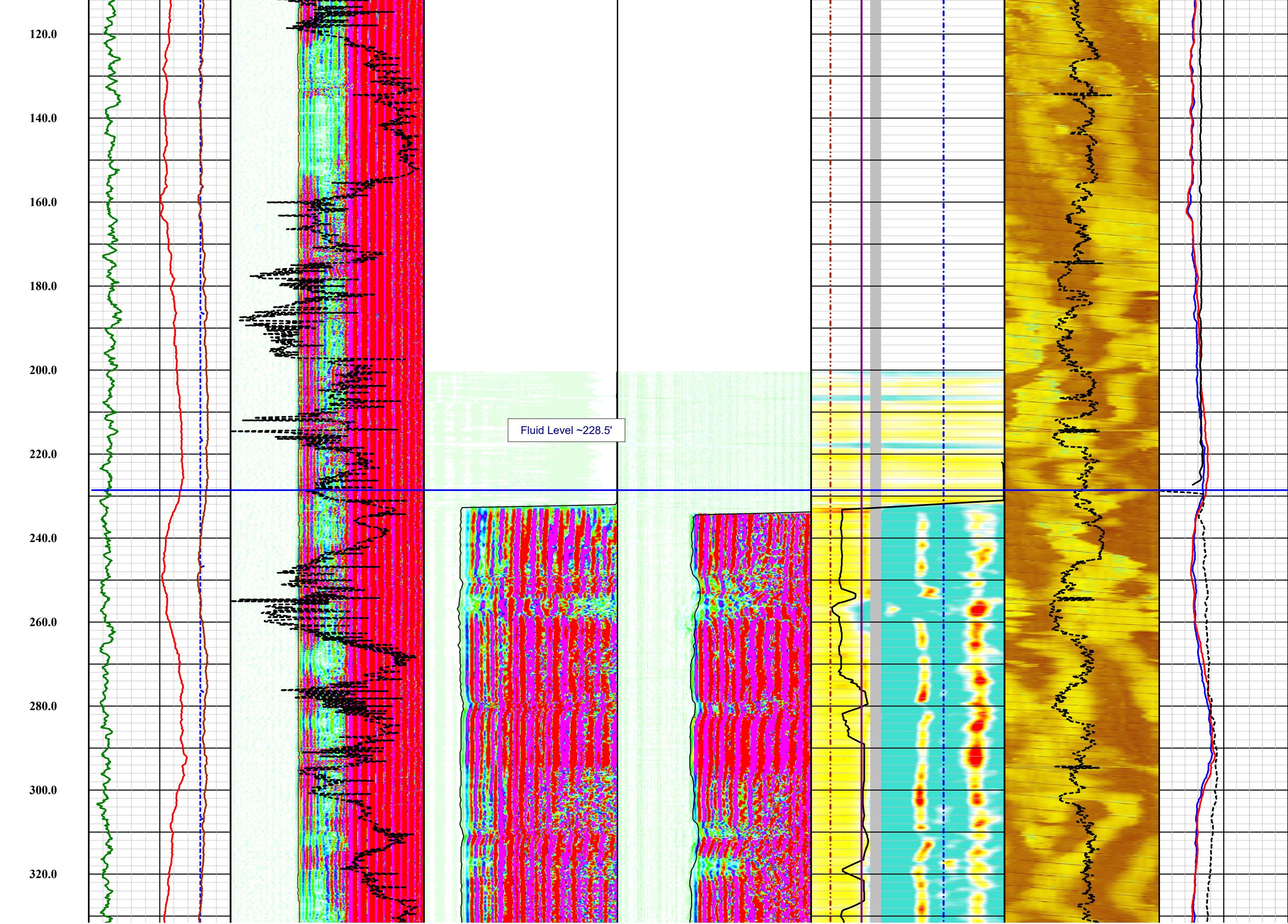
 COMPANY: FLORENCE COPPER COMPANY
 FIELD: FLORENCE COPPER SITE
 WELL ID: R-09
 COUNTY: PINAL

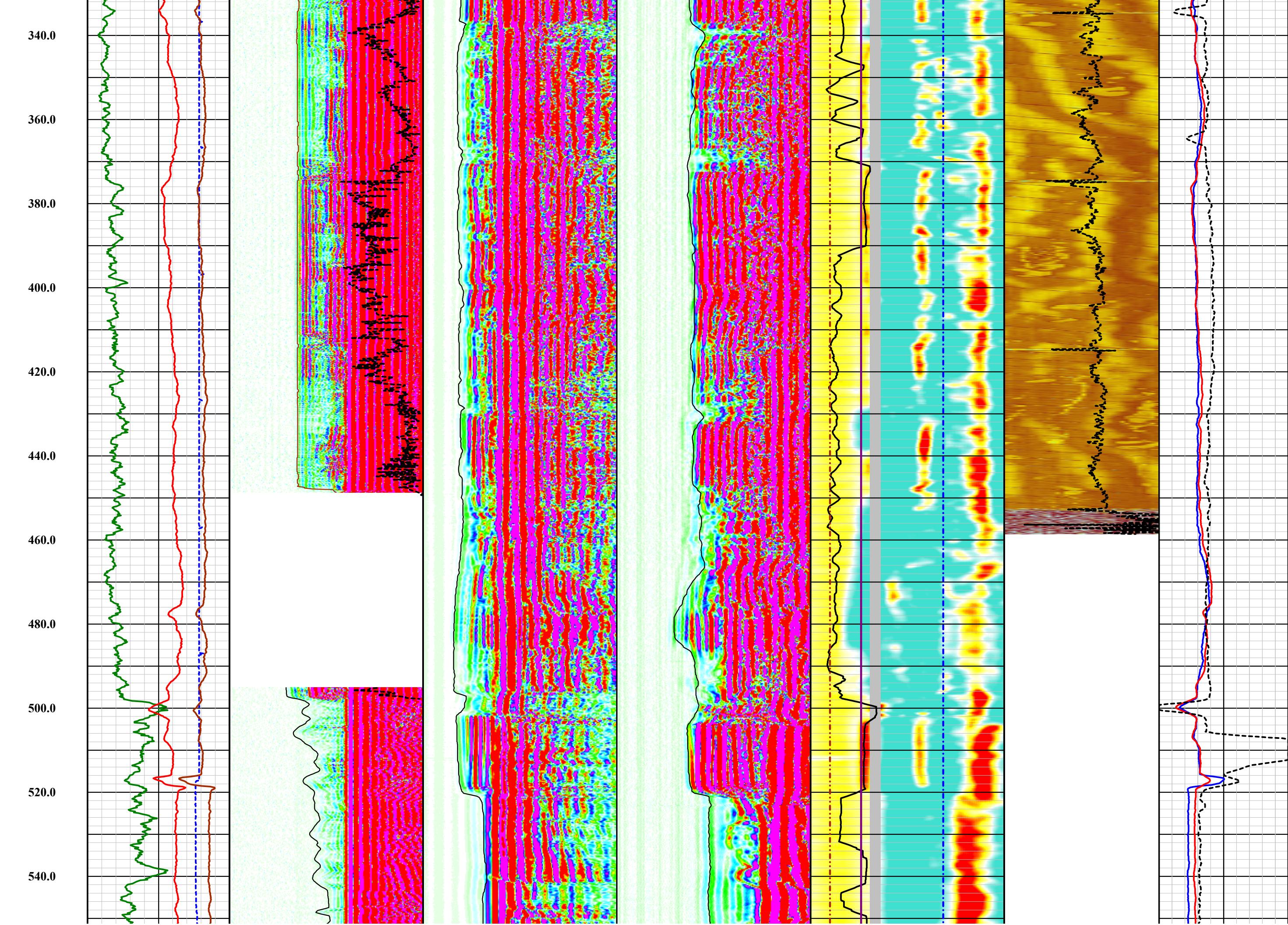
 Logging Engineer: VARIOUS
 Date Logged: VARIOUS
 Processed By: K.M / B.C.
 Date Processed: 07-18-18

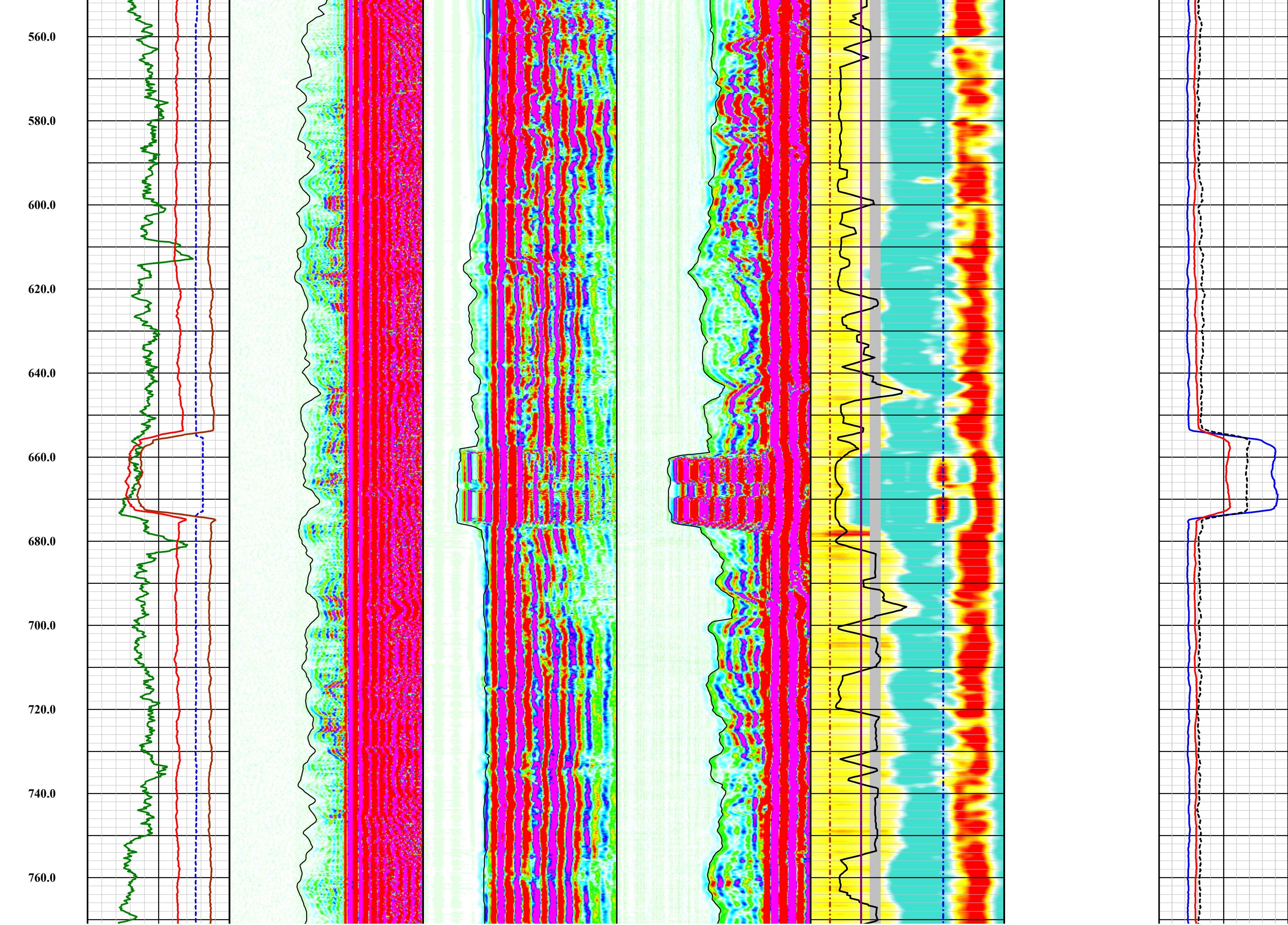


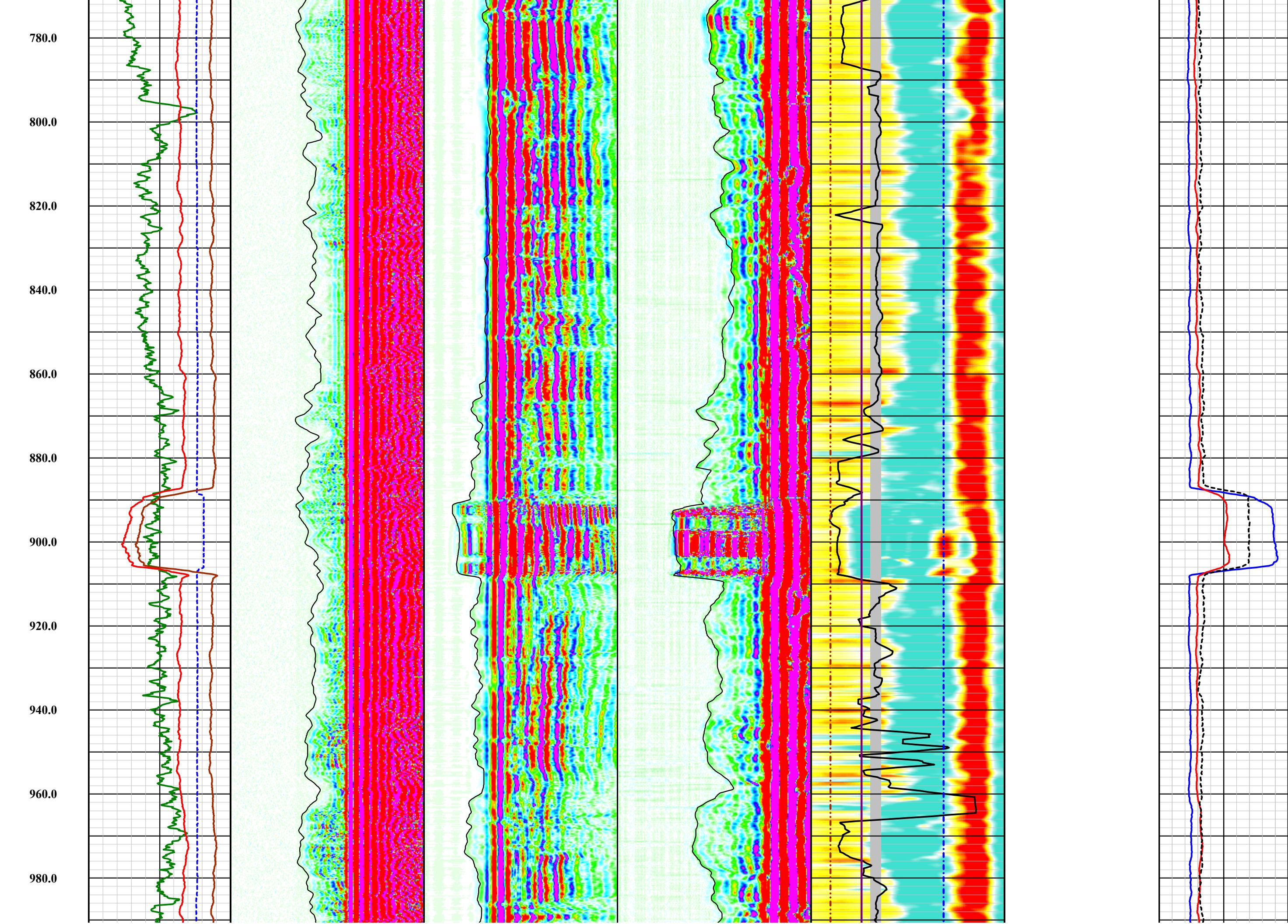
Depth 1in:20ft	R-09 Sonic CBL with Density Summary							
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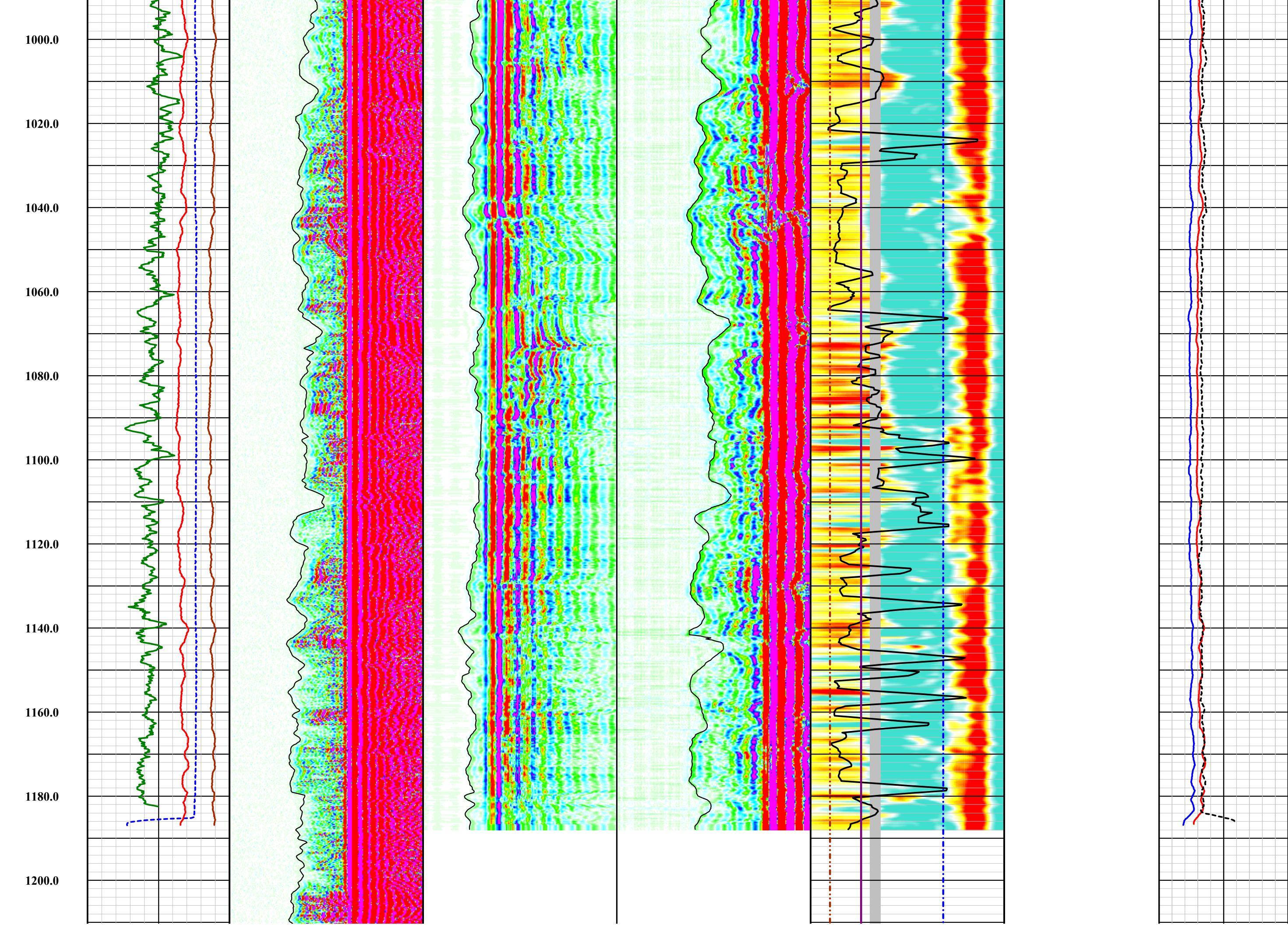


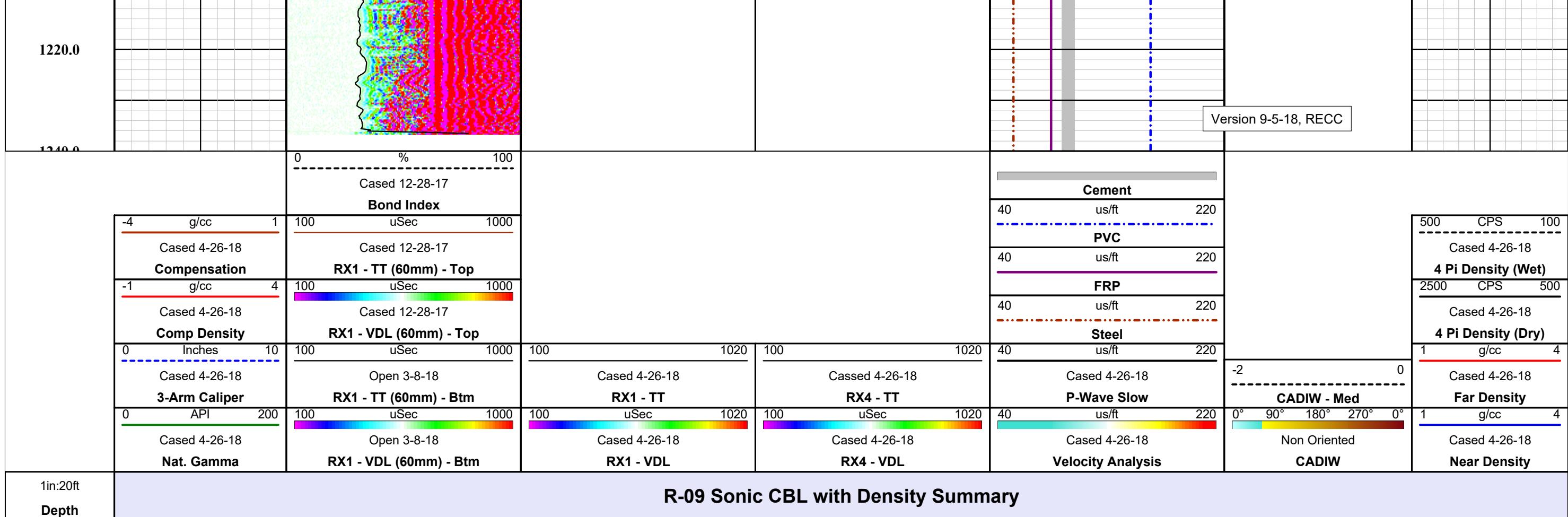












APPENDIX G

SAPT Documentation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
STANDARD ANNULAR PRESSURE TEST

Operator FLORENCE COPPER, INC

Address 1575 W. HUNT HWY

FLORENCE, AZ 85132

Well Name R-09

LOCATION INFORMATION

SW Quarter of the NE Quarter of the SW Quarter
of Section 28; Range 9E; Township 4S; County PINAL;
Company Representative IAN REAM Pressure transducer; Field Inspector LAUREN CANDREVA;
Type of Pressure Gauge with data logger inch face; 300 psi full scale; 0.001 psi increments;

New Gauge? Yes No If no, date of calibration

Calibration certification submitted? Yes No

TEST RESULTS

Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells.

For Class II wells, annulus pressure should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure.

Original chart recordings must be submitted with this form.

5-year or annual test on time? Yes No

2-year test for TA'd wells on time? Yes No

After rework? Yes No

Newly permitted well? Yes No

Time

Pressure (in psig)

Annulus Tubing

<u>12:33</u>
<u>12:43</u>
<u>12:53</u>
<u>13:03</u>

<u>172.48</u>	<u>same</u>
<u>172.38</u>	<u>same</u>
<u>172.38</u>	<u>same</u>
<u>172.41</u>	<u>same</u>

Casing size 5" - NOMINAL

Tubing size 2"

Packer type INFLATABLE PACKER

Packer set @ 5.89(top), 507.24(bottom)

Top of Permitted Injection Zone 418 feet

Is packer 100 ft or less above top of

Injection Zone ? Yes No

If not, please submit a justification.

Fluid return (gal.) 1.14

Comments: Three test were conducted to confirm results, data

for all tests included in attached chart and table

Max. Allowable Pressure Change: Initial test pressure x 0.05 8.62 psi

Test Period Pressure change 0.07 psi

Test Passed

Test Failed

If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

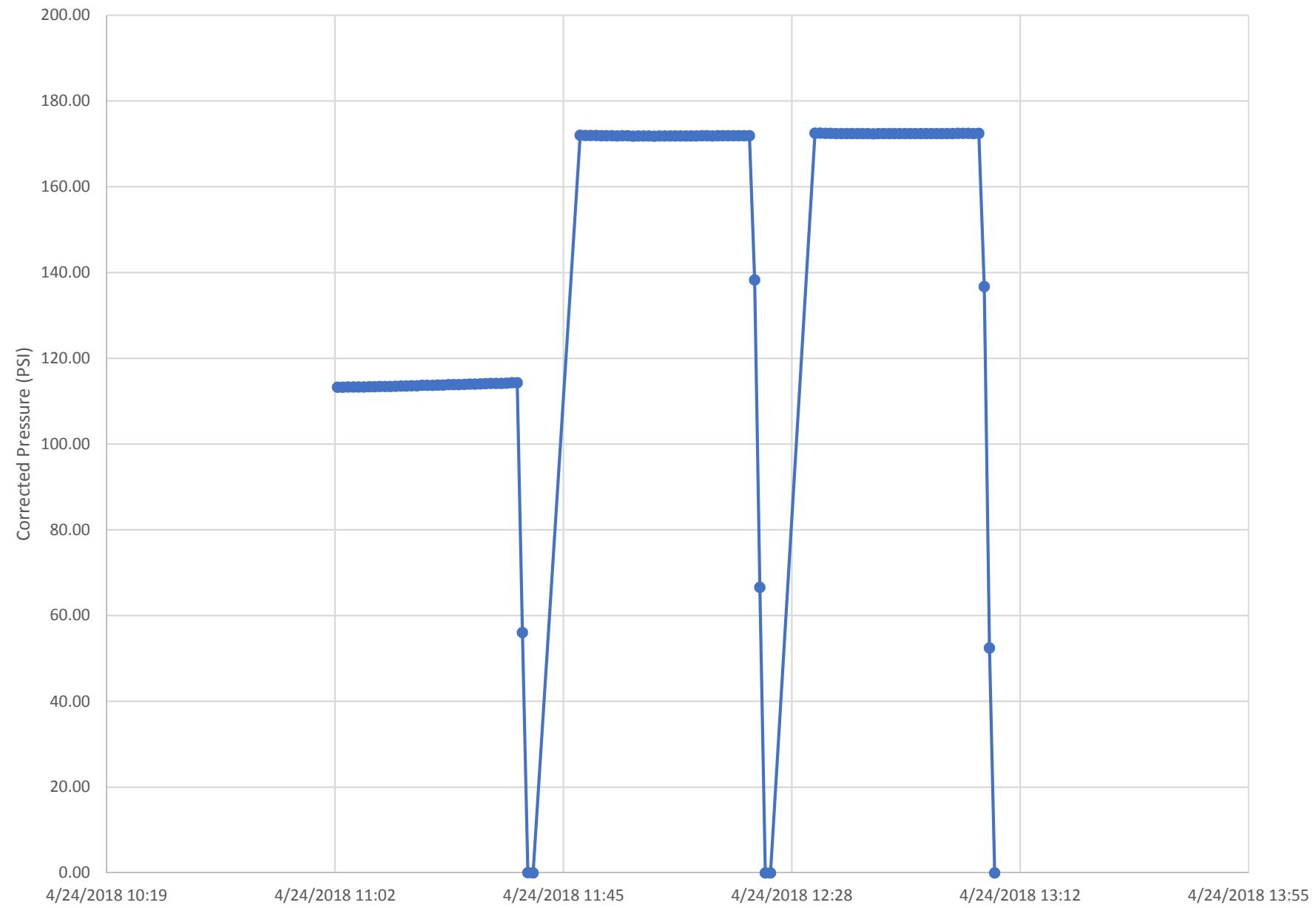
I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

Ian Ream
Printed Name of Company Representative

IR
Signature of Company Representative

9-12-2018
Date

R-09 Standard Annular Pressure Test Data



Well R-09 SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
4/24/2018 11:02	127.11	113.24
4/24/2018 11:03	127.139	113.26
4/24/2018 11:04	127.182	113.31
4/24/2018 11:05	127.174	113.30
4/24/2018 11:06	127.204	113.33
4/24/2018 11:07	127.205	113.33
4/24/2018 11:08	127.226	113.35
4/24/2018 11:09	127.261	113.39
4/24/2018 11:10	127.296	113.42
4/24/2018 11:11	127.289	113.41
4/24/2018 11:12	127.312	113.44
4/24/2018 11:13	127.367	113.49
4/24/2018 11:14	127.386	113.51
4/24/2018 11:15	127.399	113.52
4/24/2018 11:16	127.444	113.57
4/24/2018 11:17	127.443	113.57
4/24/2018 11:18	127.539	113.66
4/24/2018 11:19	127.593	113.72
4/24/2018 11:20	127.589	113.71
4/24/2018 11:21	127.637	113.76
4/24/2018 11:22	127.63	113.76
4/24/2018 11:23	127.711	113.84
4/24/2018 11:24	127.733	113.86
4/24/2018 11:25	127.756	113.88
4/24/2018 11:26	127.781	113.91
4/24/2018 11:27	127.819	113.94
4/24/2018 11:28	127.853	113.98
4/24/2018 11:29	127.889	114.01
4/24/2018 11:30	127.93	114.06
4/24/2018 11:31	127.999	114.12
4/24/2018 11:32	127.986	114.11
4/24/2018 11:33	128.029	114.15
4/24/2018 11:34	128.087	114.21
4/24/2018 11:35	128.148	114.27
4/24/2018 11:36	128.181	114.31
4/24/2018 11:37	69.899	56.02
4/24/2018 11:38	13.889	0.01
4/24/2018 11:39	13.875	0.00
4/24/2018 11:48	185.861	171.99
4/24/2018 11:49	185.83	171.96

Well R-09 SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
4/24/2018 11:50	185.822	171.95
4/24/2018 11:51	185.801	171.93
4/24/2018 11:52	185.788	171.91
4/24/2018 11:53	185.764	171.89
4/24/2018 11:54	185.764	171.89
4/24/2018 11:55	185.74	171.87
4/24/2018 11:56	185.782	171.91
4/24/2018 11:57	185.749	171.87
4/24/2018 11:58	185.682	171.81
4/24/2018 11:59	185.72	171.85
4/24/2018 12:00	185.711	171.84
4/24/2018 12:01	185.726	171.85
4/24/2018 12:02	185.684	171.81
4/24/2018 12:03	185.743	171.87
4/24/2018 12:04	185.693	171.82
4/24/2018 12:05	185.718	171.84
4/24/2018 12:06	185.699	171.82
4/24/2018 12:07	185.704	171.83
4/24/2018 12:08	185.734	171.86
4/24/2018 12:09	185.739	171.86
4/24/2018 12:10	185.696	171.82
4/24/2018 12:11	185.756	171.88
4/24/2018 12:12	185.752	171.88
4/24/2018 12:13	185.736	171.86
4/24/2018 12:14	185.751	171.88
4/24/2018 12:15	185.747	171.87
4/24/2018 12:16	185.763	171.89
4/24/2018 12:17	185.762	171.89
4/24/2018 12:18	185.787	171.91
4/24/2018 12:19	185.772	171.90
4/24/2018 12:20	185.792	171.92
4/24/2018 12:21	152.119	138.24
4/24/2018 12:22	80.476	66.60
4/24/2018 12:23	13.878	0.00
4/24/2018 12:24	13.879	0.00
4/24/2018 12:33	186.358	172.48
4/24/2018 12:34	186.353	172.48
4/24/2018 12:35	186.319	172.44
4/24/2018 12:36	186.318	172.44
4/24/2018 12:37	186.266	172.39

Well R-09 SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
4/24/2018 12:38	186.286	172.41
4/24/2018 12:39	186.268	172.39
4/24/2018 12:40	186.271	172.40
4/24/2018 12:41	186.25	172.38
4/24/2018 12:42	186.283	172.41
4/24/2018 12:43	186.257	172.38
4/24/2018 12:44	186.237	172.36
4/24/2018 12:45	186.265	172.39
4/24/2018 12:46	186.279	172.40
4/24/2018 12:47	186.287	172.41
4/24/2018 12:48	186.257	172.38
4/24/2018 12:49	186.251	172.38
4/24/2018 12:50	186.246	172.37
4/24/2018 12:51	186.255	172.38
4/24/2018 12:52	186.248	172.37
4/24/2018 12:53	186.257	172.38
4/24/2018 12:54	186.277	172.40
4/24/2018 12:55	186.255	172.38
4/24/2018 12:56	186.269	172.39
4/24/2018 12:57	186.276	172.40
4/24/2018 12:58	186.281	172.41
4/24/2018 12:59	186.264	172.39
4/24/2018 13:00	186.297	172.42
4/24/2018 13:01	186.32	172.45
4/24/2018 13:02	186.305	172.43
4/24/2018 13:03	186.283	172.41
4/24/2018 13:04	186.314	172.44
4/24/2018 13:05	150.587	136.71
4/24/2018 13:06	66.329	52.45
4/24/2018 13:07	13.881	0.01

APPENDIX H

Well Development Field Forms

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FCI PTF	Project No.: 129678
Well No.: R-09	Date: 4/16/18
Location: Florence, AZ	Measuring Point: discharge
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): 500 - 1100
Pump Type/Setting (ft bbls): Airlift	Activity: Airlift
How Q Measured: 5 gal bucket + Stopwatch	H&A Personnel: T. Snow /

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{mhos/cm}$)	Temp. °C	Turbidity NTU	Comments
2045	~2	419'	-	START AIRLIFT @ 419'					
2200	~2	619'	-	0.1	8.26	1424	18.73	22.1	Lt. Brown
2330	~2	619'	-	0.1	8.40	1463	18.11	24.0	Lt. Brown
0030	~2	619'	-	0.1	8.51	1492	17.70	OR	Lt. Brown
0040	—	—	AIRLIFT OFF						
0140	—	—	AIRLIFT ON @ 620'						
0330	~4	620'	-	0	8.34	1506	19.85	9.16	Cloudy Clear
0410	—	—	AIRLIFT OFF						
0500	—	—	AIRLIFT ON @ 840'						
0530	~6	840	-	0.1	8.04	1287	12.66	28.6	Clear
0610	~6	840	-	0	8.26	1583	22.71	7.79	CLEAR
0640	~6	840	-	0	8.28	1543	22.61	7.00	CLEAR
0745	—	—	AIRLIFT OFF						
0745	—	—	AIRLIFT ON @ 1000 ft						
1000	~6	1000	-	0	7.97	1792	23.34	15.6	CLEAR
1100	~6	1000	-	0	8.16	1643	24.31	19.9	CLEAR
1105	—	—	AIRLIFT OFF						
2215	~6	1000	AIRLIFT ON @ 1100'						
2230	~10	1080	-	1.0	8.36	1429	18.46	6.41	Lt. Brown
0000	~6	1087	-	0.4	8.23	1436	19.21	4.37	Lt. Brown
0100	~10	1095	-	2.0	8.17	1457	19.11	9.2	Lt. Brown
0200	~10	1103	-	0.5	8.40	1959	19.08	12.4	Lt. Brown / cloudy
0200	~6	110	-	0.2	8.55	1473	19.82	39.7	Cloudy
0600	~6	110	-	0	8.63	1492	19.78	24.0	Clear @ 1104 ft
0730	~6	1064	-	0	8.35	1555	22.04	30.1	CLEAR
0735	—	—	AIRLIFT OFF						
1900	—	—	START AIRLIFT @ 1072'						
1930	~8	1072	-	0	8.21	1437	21.09	28.6	Clear

Comments:

**DEVELOPMENT
FIELD DATA LOG**

Project Name: <u>FCI - PTF</u>	Project No.: <u>129687</u>
Well No.: <u>R-09</u>	Date: <u>4/18/18</u>
Location: <u>Florence, AZ</u>	Measuring Point: <u>discharge</u>
Total Depth of Well (ft bbls): <u>1200</u>	Screen Interval (ft bbls): <u>500 - 1200</u>
Pump Type/Setting (ft bbls): <u>Airlift</u>	Activity: <u>Airlift</u>
How Q Measured: <u>Cone / Stopwatch</u>	H&A Personnel: <u>T. Snow / C. Giusti</u>

Time	Discharge (gpm)	Pumping Water Level (ft bbls)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{mos}/\text{cm}$)	Temp. °C	Turbidity NTU	Comments
2030	~8	1072	4410	0	8.15	1409	20.16	25.2	Cloudy Clear
2000	~8	1072	—	0	8.10	1410	19.97	16.7	Clear
2000	~8	1087	—	0	8.07	1400	19.90	29.6	Clear
0130	~8	1087	—	0	8.11	1397	19.72	18.7	Clear
0300	~8	1095	—	0	8.16	1393	19.12	18.0	Clear
0430	~8	1088	—	0	8.19	1390	19.04	21.1	Clear
0545	~8	1140	—	0	8.27	1382	18.85	12.8	Clear
0710	—	AIRLIFT OFF	—	—	—	—	—	—	—
1550	—	AIRLIFT ON @	1133	—	—	—	—	—	—
1555	~9	1140	—	0	8.13	1553	22.31	37.7	Clear
1620	~9	1140	—	0	8.35	1570	22.89	17.4	Clear
1650	~9	1162	—	0	8.39	1498	22.31	14.0	Clear
1700	—	AIRLIFT OFF	—	—	—	—	—	—	—
1710	—	AIRLIFT ON	—	—	—	—	—	—	—
1725	~9	1162	—	52	8.43	1509	21.50	OR	Light brown
1900	~9	1175	—	0.1	8.20	1330	21.37	38.2	Light brown
2000	~9	1175	—	0	8.80	1457	21.04	17.0	Light brown
2115	~9	1175	—	0	8.81	1454	-9.99*	14.1	Lt. Brown
2330	~9	1181	—	0.5	8.96	1369	—	4.20	Brown
0100	~9	1180	—	0.5	8.91	1453	—	87.8	Lt. Brown
0200	~9	1185	—	0.3	8.90	1450	—	88.8	Lt. Brown
0300	~9	1185	—	0.1	8.89	1451	—	42.1	Lt. Brown / Cloudy
0345	—	AIRLIFT OFF @	1188	—	—	—	—	—	—
0415	—	AIRLIFT ON @	1185 ft	—	—	—	—	—	—
0430	~9	1185	—	0.1	8.48	1521	21.52	511	Lt. Brown
0500	~9	1185	—	0.1	8.49	1530	22.16	490	Lt. Brown
0215	~9	1187	—	1.3	8.48	1611	24.41	382	Lt. Brown / Cloudy
0345	—	1190	—	0.3	8.46	1611	24.33	490	Lt. Brown

Comments:

* Temp YSI sensor not working

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FCI - PTP	Project No.: 12968-T
Well No.: R-09	Date: 4-20-18
Location:	Measuring Point:
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): 520 - 1200
Pump Type/Setting (ft bbls): AIRLIFT	Activity: AIRLIFT
How Q Measured: Bucket & stopwatch	H&A Personnel: C. Price

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments
1405	~9	1193	—	0.5	8.48	1633	25.01	49.3	MICKEY
1445	~9	1193	—	10	8.47	1631	24.89	48.6	10 ppm is filter pack
1510	~9	1193	—	8	8.44	1598	24.51	OR	BROWN sand is FINE SAND
1710	~9	1197	—	10	8.	1572	23.11	OR	BROWN SANDY
1900	~9	1200	—	0.5	8.40	1447	22.36	42.3	LT. BROWN / SILT
1945	—	AIRLIFT ON	—	—	—	—	—	—	—
2015	—	AIRLIFT ON	—	—	—	—	—	—	FOR SURGE
2055	~9	1200	—	0	8.51	1450	26.10	14.8	CLEAR
2105	~9	1200	—	8	8.43	1501	26.88	9.64	CLEAR
2110	—	AIRLIFT ON	—	—	—	—	—	—	—
2205	~9	1200	—	0	8.45	1451	26.68	7.00	CLEAR
2220	—	AIRLIFT OFF	—	—	—	—	—	—	—
—	—	INJECT + SWAB CHLORINE	—	—	—	—	—	—	—
1330	—	AIRLIFT ON	—	400	81	—	—	—	—
1410	—	A	—	—	—	—	—	—	—
1400	~3	400	—	—	—	—	—	—	LIGHT BROWN
1430	~3	400	—	—	—	—	—	—	LIGHT BROWN
1500	~3	400	—	—	—	—	—	—	MICKEY
1510	—	AIRLIFT OFF	—	—	—	—	—	—	—
1620	—	AIRLIFT ON	—	0	8.54	3541	22.74	600	SI
1630	~8	600	—	0.1	8.54	3541	22.74	OR	BROWN
1645	~8	600	—	<0.1	8.50	3141	23.17	OR	BROWN
1700	~8	600	—	0.1	8.50	3086	23.19	363	LT. BROWN
1715	~8	600	—	<0.1	8.57	2908	23.33	341	LT. BROWN
1730	~8	600	—	<0.1	8.29	2827	23.41	297	LT. BROWN
1745	~8	600	—	<0.1	8.53	2873	23.32	291	LT. BROWN
1755	—	AIRLIFT OFF	—	—	—	—	—	—	—
Comments:									
Unable to collect field parameters for outflow @ 400' → see Field notes									

**DEVELOPMENT
FIELD DATA LOG**

Project Name:	FCI PTF	Project No.:	129687-007
Well No.:	11-039	Date:	4-21-18
Location:	FLORRENCE, AZ	Measuring Point:	—
Total Depth of Well (ft bbls):	1200	Screen Interval (ft bbls):	520 - 1200
Pump Type/Setting (ft bbls):	AIRLIFT	Activity:	
How Q Measured:	BUCKET + Stopwatch	H&A Personnel:	C. Gruber / E. Fredrickson

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{hos/cm}$)	Temp. °C	Turbidity NTU	Comments
1820	—	—	Airlift	on	①	800	—	—	
1850	~6	800'	—	6.01	8.63	3658	22.7	452	Lt. Brown
1910	~6	800'	—	6.01	8.64	3321	22.48	253	Milky
1940	~6	800'	—	6.01	8.57	3143	22.73	214	Milky
2000	~6	800'	—	0	8.59	2978	22.82	931	Milky
2030	~6	800'	—	0	8.55	2852	20.40	193	Milky
2035	~6	800'	AIRLIFT	OFF	—	—	—	—	
2125	—	—	Airlift	on	①	~1000'	—	—	
2150	~6	1000'	—	0	8.61	3849	21.88	694	Lt. Brown
2230	~6	1000'	—	0	8.45	2658	22.14	244	Milky
2300	~6	1000'	—	0	8.50	2435	22.57	86.0	Clear
2330	~6	1000'	—	0	8.59	2780	19.07	49.8	Clear
0000	~6	1000'	—	0	8.44	2264	22.15	29.2	Clear
0005	—	—	Airlift	OFF	—	—	—	—	
0050	—	—	Airlift	on	①	~1120'	—	—	
0100	~6	1120'	—	2.50	8.37	4300	22.40	0R	Brown
0200	~6	1120'	—	0	8.33	2291	22.45	43	Milky
0245	~6	1120'	—	0	8.40	2142	22.36	23.7	Clear
0250	—	—	Airlift	OFF	—	—	—	—	
0315	—	—	Airlift	on	①	1197'	—	—	
0340	~3	1197'	—	0	8.38	2037	20.45	51.0	Clear
0400	~2	1197'	—	3.30	8.34	3079	21.49	0R	Brown / Silt
0430	~2	1197'	—	2.0	8.39	2182	22.13	827	Lt. Brown
0500	~2	1197'	—	2.2	8.49	2072	21.83	587	Lt. Brown
0530	~2	1197'	—	0	8.68	2036	22.05	751	Milky
100	~8	1195	—	100	8.73	1986	22.87	190	MURKY (100ml/L FILTER PACK)
125	~8	1195	—	20	8.63	1944	22.18	47.2	FREE CO ₂ > 4.40
155	~8	1195	—	23	8.66	1948	22.83	49.4	Filter Pack

Comments:

DEVELOPMENT FIELD DATA LOG

Project Name: FC 1 PTF	Project No.: 129687-007
Well No.: R - 09	Date: 4-22-18
Location: Florence, AZ	Measuring Point: —
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): 520 - 1200
Pump Type/Setting (ft bbls): AIRLIFT	Activity: AIRLIFT
How Q Measured: Bucket + Stadwehr	H&A Personnel: C HUSTI

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FCI PTF	Project No.: 189687-607
Well No.: R-09	Date: 4-26-18 4-23-18
Location: Florence, AZ	Measuring Point: Sandbar Port
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): 820 - 1200
Pump Type/Setting (ft bbls): Gravel pack 1160	Activity: Pump development
How Q Measured: Totalizer	H&A Personnel: E. Fredrickson / C. Gruska

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{hos/cm}$)	Temp. °C	Turbidity NTU	Comments	
									Chlorine (mg/l)	Total
0120					Pump	on (w)	11.60	-		
0130	51	1160.2451	0.1	7.70	1841	23.41	4.38	Cloudy	74.4	" "
0200	52	246.2	0	7.84	1806	24.33	41.1	Clear	74.4	" "
0215	52	247.3	0	7.76	1764	24.63	14.9	Clear	74.4	" "
0230					Pump	off	-	-		
0255					pump	on	-	-		
0310	52	247.1	0	7.81	1707	24.52	11.6	Clear	-	-
0325	52	248.5	0	7.79	1712	24.62	4.08	Clear	-	-
0340	52	249.7	0	7.80	1706	24.82	3.17	Clear	-	-
0355	52	249.6	0	7.80	1694	24.71	3.01	Clear	2.04	3.44
0400					pump	off	-	-		
0435					pump	on	-	-		
0445	52	247.9	0	7.78	1662	24.34	6.03	Clear	1.94	2.31
0500	52	248.7	0	7.80	1682	24.58	2.95	Clear	1.44	1.64
0515	52	249.4	0	7.79	1681	24.76	2.45	Clear	-	-
0520					Pump	off	-	-		
0615	7	7.	—	0	7.73	1037	23.42	5.43	Clear	
0645	7	249.8	—	0	7.75	1067	24.04	3.08	Clear	
0700	7	249.9	—	0	7.67	1058	24.08	2.16	Clear	0.0
705					PUMP	OFF	-	-		
700	0	235.1	—	PUMP ON	0	9.00	-	-		
830	62	249.9	1020110	0	7.84	1072	25.51	6.23	CLEAR	
900	62	250.1	1022700	0	7.84	1074	25.64	2.15	CLEAR	
915	62	250.3	1023740	0	7.83	1079	25.75	2.53	CLEAR	
925				PUMP OFF	FOR SURGE	-	-	-		
9450				PUMP ON	0	9.00	-	-		
0952	62	248	1024570	0	7.83	1056	25.35	6.13		
1004	62	249.5	1025300	0	7.78	1083	25.78	1.76	CLEAR	

Comments:

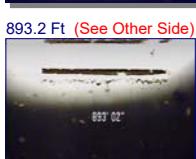
DEVELOPMENT FIELD DATA LOG

Project Name: FLC PTF	Project No.: 1794e87-007
Well No.: R-09	Date: 4-23-18
Location: Florence, AZ	Measuring Point: TBL
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): 520 - 1200
Pump Type/Setting (ft bbls): 90B / Grundfos	Activity: Pump Development
How Q Measured: Totalizer	H&A Personnel: C. BURKE

APPENDIX I

Well Video Log and Gyroscopic Survey Reports

Client: Florence Copper Survey Date: May 06, 2018
 Address: 1575 W. Hunt Hwy Invoice: _____ Run: 1
 City: Florence State: AZ Zip: 85132 Well Name: R-09
 Requested By: Florence Copper P.O.: _____ Well Owner: Florence Copper
 Copy To: _____ Camera: CCV Color Flip Camera - Ring of Lights
 Purpose: General Inspection Zero Datum: Top of Casing
 Location: _____ Depth: _____ Vehicle: 290
 Field: FLORENCE COPPER Type Perfs: Horizontal Slots
 1st Csg.O.D. 5 In. Csg Weight: _____ From: 0 ft. To: 1200 ft. 2nd Csg.O.D. _____ Csg Weight: _____ From: _____ To: _____
 Standing Water Level: 228.4 ft. Pumping Water Level: _____ Pump Depth: _____ O.D.Ref.: Measured Casing Buildup: Light, Increasing W/ Depth
 Operator: M. Quinones Lat.: _____ Long.: _____ Sec: _____ Twp: _____ Rge: _____

Other Information:		True Depths: (SideScan-Feet)	WELLBORE / CASING INFORMATION
<u>0 Ft (See Other Side)</u>	<u>8 Ft (See Other Side)</u>	0	Start of Video Survey
		8	Side Scan of Casing Joint
		228.4	Static Water Level
		521.3	Bottom of Fiber Glass Casing
<u>228.4 Ft (See Other Side)</u>	<u>521.3 Ft (See Other Side)</u>	521.9	Top of PVC Casing
		522	Top of 1st Set of Perforations
		658.1	Bottom of 1st Set of Perforations
		678.4	Top of 2nd Set of Perforations
<u>521.9 Ft (See Other Side)</u>	<u>522 Ft (See Other Side)</u>	893.2	Bottom of 2nd Set of Perforations
		912.4	Top of 3rd Set of Perforations
		980.5	Side Scan of Perforations Partially Clogged
<u>658.1 Ft (See Other Side)</u>	<u>678.4 Ft (See Other Side)</u>	1,007.1	Side Scan of Perforations Mostly Clogged
			
<u>893.2 Ft (See Other Side)</u>	<u>912.4 Ft (See Other Side)</u>		
			
<u>980.5 Ft (See Other Side)</u>	<u>1007.1 Ft (See Other Side)</u>		
			

Notes:

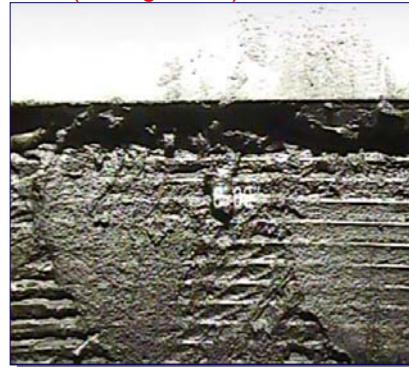
Page Number: 1

12 WELLBORE SHAPSHOTS

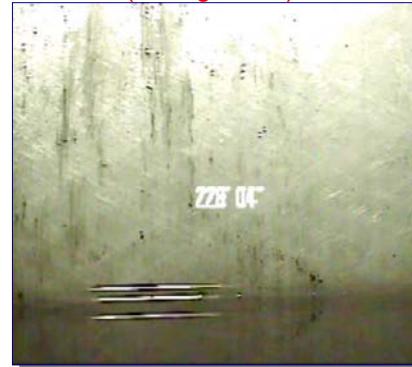
0 Ft (Enlargement)



8 Ft (Enlargement)



228.4 Ft (Enlargement)



521.3 Ft (Enlargement)



521.9 Ft (Enlargement)



522 Ft (Enlargement)



658.1 Ft (Enlargement)



678.4 Ft (Enlargement)



893.2 Ft (Enlargement)



912.4 Ft (Enlargement)



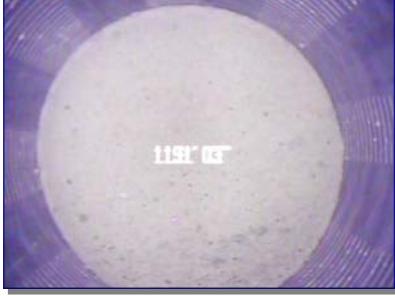
980.5 Ft (Enlargement)



1007.1 Ft (Enlargement)



Client: Florence Copper Survey Date: May 06, 2018
 Address: 1575 W. Hunt Hwy Invoice: _____ Run: 1
 City: Florence State: AZ Zip: 85132 Well Name: R-09
 Requested By: Florence Copper P.O.: _____ Well Owner: Florence Copper
 Copy To: _____ Camera: CCV Color Flip Camera - Ring of Lights
 Purpose: General Inspection Zero Datum: Top of Casing
 Location: _____ Depth: _____ Vehicle: 290
 Field: FLORENCE COPPER Type Perfs: Horizontal Slots
 1st Csg.O.D. 5 In. Csg Weight: _____ From: 0 ft. To: 1200 ft. 2nd Csg.O.D. _____ Csg Weight: _____ From: _____ To: _____
 Standing Water Level: 228.4 ft. Pumping Water Level: _____ Pump Depth: _____ O.D.Ref.: Measured Casing Buildup: Light, Increasing W/ Depth
 Operator: M. Quinones Lat.: _____ Long.: _____ Sec: _____ Twp: _____ Rge: _____

Other Information:	True Depths: (SideScan-Feet)	WELLBORE / CASING INFORMATION
Wellbore Snapshots	<u>1183.1 Ft (See Other Side)</u>  <u>1191.3 Ft (See Other Side)</u>  <u>1192.7 Ft (See Other Side)</u> 	<u>1,183.1</u> Side Scan of Perforations Almost Completely Clogged <u>1,191.3</u> Down Hole View of Bottom of Well Soft Fill <u>1,192.7</u> End of Video Survey

Notes:

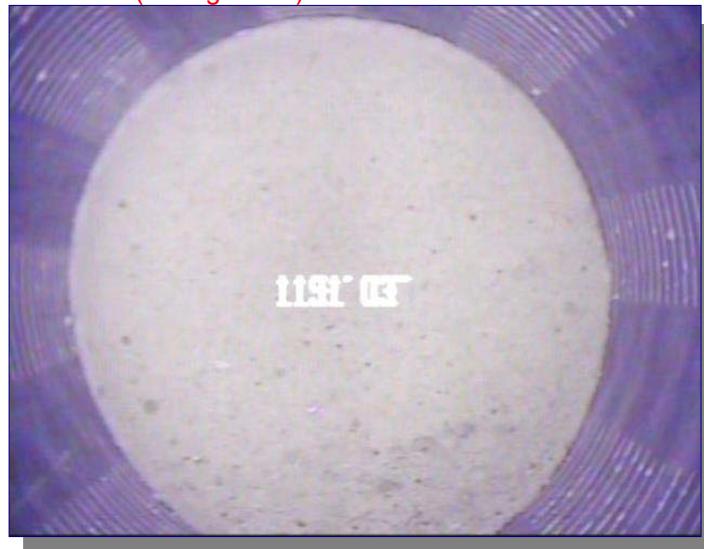
Page Number: 3

3 WELBORE SHAPSHOTS

1183.1 Ft (Enlargement)



1191.3 Ft (Enlargement)



1192.7 Ft (Enlargement)



Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR
Florence Copper and Florence Copper
R-09

Monday - May 7, 2018



This Wellbore Interpretation Package represents our best efforts to provide a correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical or other types of measurements, we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by Customer resulting from any interpretation made by this document. We do not warrant or guarantee the accuracy of the data, specifically including (but without limitations) the accuracy of data transmitted by electronic process, and we will not be responsible for accidental or intentional interception of such data by third parties. Our employees are not empowered to change or otherwise modify the attached interpretation. Furthermore, along with Eagle Pro Software we do not warrant or guarantee the accuracy of the programming techniques employed to produce this document. By accepting this Interpretation Package, the Customer agrees to the foregoing, and to our General Terms and Conditions.

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company:	Florence Copper		Well Owner:	Florence Copper	
County:	Pinal	State:	Arizona	Country:	United States
Well Number:	R-09	Survey Date:	Monday - May 7, 2018	Magnetic Declination:	Declination Correction Not Used
Field:	Florence Copper Project		Drift Calculation Methodology:		Balanced Tangential Method
Location:					
Remarks:					
Witness:	H&A	Vehicle No.:	310	Invoice No.:	Operator: E. BEAM
Tool:	Gyro - 1714		Lat.:	Long.:	Sec.: Twp.: Rge.:

MEASURED DATA			DATA COMPUTATIONS						
DEPTHs, feet	INCLINATIONS, degrees	AZIMUTHs, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEg SEV., degrees per 20 Feet	DOGLEg SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
0	0.18	355.07	0.00						
20	0.25	228.74	19.99	0.003	-0.035	1.00	9.31	0.04' (.48")	274.10
40	0.31	252.96	39.98	-0.042	-0.120	0.41	2.19	0.13' (1.56")	250.80
60	0.37	317.77	59.97	-0.010	-0.215	0.96	5.59	0.22' (2.64")	267.30
80	0.38	016.57	79.96	0.101	-0.239	0.84	5.12	0.26' (3.12")	292.90
100	0.31	037.91	99.96	0.207	-0.187	0.42	1.93	0.28' (3.36")	318.00
120	0.41	038.41	119.95	0.306	-0.109	0.13	0.05	0.32' (3.84")	340.30
140	0.46	073.42	139.94	0.385	0.012	0.43	3.14	0.39' (4.68")	001.80
160	0.42	086.20	159.93	0.413	0.162	0.83	1.16	0.44' (5.28")	021.40
180	0.39	095.59	179.92	0.411	0.303	0.95	0.85	0.51' (6.12")	036.40
200	0.34	125.64	199.91	0.370	0.419	0.37	2.70	0.56' (6.72")	048.60
220	0.48	148.30	219.90	0.264	0.511	1.00	2.05	0.58' (6.96")	062.70
240	0.47	166.72	239.89	0.113	0.574	1.00	1.67	0.58' (6.96")	078.90
260	0.39	205.81	259.88	-0.028	0.563	0.34	3.49	0.56' (6.72")	092.90
280	0.34	222.95	279.87	-0.133	0.493	0.93	1.55	0.51' (6.12")	105.10
300	0.40	242.43	299.86	-0.209	0.391	0.78	1.76	0.44' (5.28")	118.10
320	0.39	280.47	319.85	-0.229	0.262	0.53	3.40	0.35' (4.20")	131.10
340	0.30	307.81	339.84	-0.185	0.154	0.00	2.46	0.24' (2.88")	140.20

Page No. 1 True Vertical Depth: **1188.50'** Final Drift Distance: **5.92'** (71.04") Final Drift Bearing: **204.60°**

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

R-09

MEASURED DATA			DATA COMPUTATIONS						
DEPTHs, feet	INCLINATIONS, degrees	AZIMUTHs, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEg SEV., degrees per 20 Feet	DOGLEg SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
360	0.35°	333.74°	359.83	-0.098	0.086	0.56	2.34	0.13' (1.56")	138.90
380	0.46°	017.80°	379.82	0.033	0.084	0.73	3.91	0.09' (1.08")	068.30
400	0.35°	060.58°	399.81	0.139	0.162	0.88	3.80	0.21' (2.52")	049.20
420	0.42°	069.32°	419.80	0.195	0.284	0.20	0.79	0.34' (4.08")	055.50
440	0.47°	121.52°	439.79	0.178	0.423	0.97	4.59	0.46' (5.52")	067.20
460	0.46°	177.49°	459.78	0.055	0.496	0.96	4.89	0.50' (6.00")	083.70
480	0.28°	188.22°	479.77	-0.074	0.493	0.12	0.98	0.50' (6.00")	098.50
500	0.27°	336.04°	499.76	-0.079	0.467	0.81	10.02	0.47' (5.64")	099.60
520	0.38°	009.21°	519.75	0.030	0.458	0.59	2.98	0.46' (5.52")	086.30
540	0.79°	004.01°	539.74	0.233	0.478	0.73	0.47	0.53' (6.36")	064.00
560	0.90°	353.58°	559.73	0.527	0.470	0.28	0.95	0.71' (8.52")	041.80
580	0.65°	225.10°	579.72	0.603	0.372	0.77	9.39	0.71' (8.52")	031.70
600	0.76°	322.32°	599.71	0.628	0.211	0.49	7.83	0.66' (7.92")	018.50
620	0.79°	345.09°	619.70	0.866	0.094	0.69	2.06	0.87' (10.44")	006.20
640	0.28°	098.60°	639.69	0.992	0.107	0.13	8.72	1.00' (12.00")	006.10
660	0.24°	045.55°	659.68	1.014	0.185	0.83	4.66	1.03' (12.36")	010.40
680	0.40°	198.23°	679.67	0.977	0.193	0.80	10.14	1.00' (12.00")	011.20
700	0.20°	325.05°	699.66	0.939	0.151	0.25	9.33	0.95' (11.40")	009.10
720	0.80°	268.45°	719.65	0.964	-0.009	0.54	4.95	0.96' (11.52")	359.50
740	0.53°	206.25°	739.64	0.877	-0.189	0.24	5.39	0.90' (10.80")	347.80
760	0.60°	187.19°	759.63	0.690	-0.243	0.94	1.73	0.73' (8.76")	340.60
780	0.82°	194.88°	779.62	0.448	-0.293	0.65	0.70	0.54' (6.48")	326.80
800	1.10°	230.66°	799.61	0.188	-0.478	0.97	3.20	0.51' (6.12")	291.50
820	0.69°	169.68°	819.60	-0.052	-0.605	0.06	5.29	0.61' (7.32")	265.10
840	1.14°	197.39°	839.59	-0.360	-0.643	0.29	2.50	0.74' (8.88")	240.70
860	0.63°	187.39°	859.58	-0.659	-0.717	0.57	0.91	0.97' (11.64")	227.40
880	0.59°	149.22°	879.57	-0.857	-0.678	0.47	3.41	1.09' (13.08")	218.40
900	0.71°	138.24°	899.56	-1.038	-0.543	0.42	1.00	1.17' (14.04")	207.60
920	0.74°	204.39°	919.55	-1.248	-0.514	0.69	5.69	1.35' (16.20")	202.40
940	0.88°	192.97°	939.54	-1.515	-0.602	0.04	1.04	1.63' (19.56")	201.70
960	1.13°	208.14°	959.53	-1.839	-0.729	0.30	1.38	1.98' (23.76")	201.60
980	0.60°	209.72°	979.52	-2.104	-0.874	0.98	0.15	2.28' (27.36")	202.60
1,000	1.13°	195.57°	999.52	-2.385	-0.979	0.95	1.29	2.58' (30.96")	202.30

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC
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PLANE OF DRIFT VIEW - R-09

Florence Copper

Florence Copper

Drift Distance = 5.92 Feet

Drift Bearing = 204.6 Degrees

True Vertical Depth = 1188.50 Feet



Date of Survey: Monday - May 7, 2018

Balanced Tangential Calculation Method

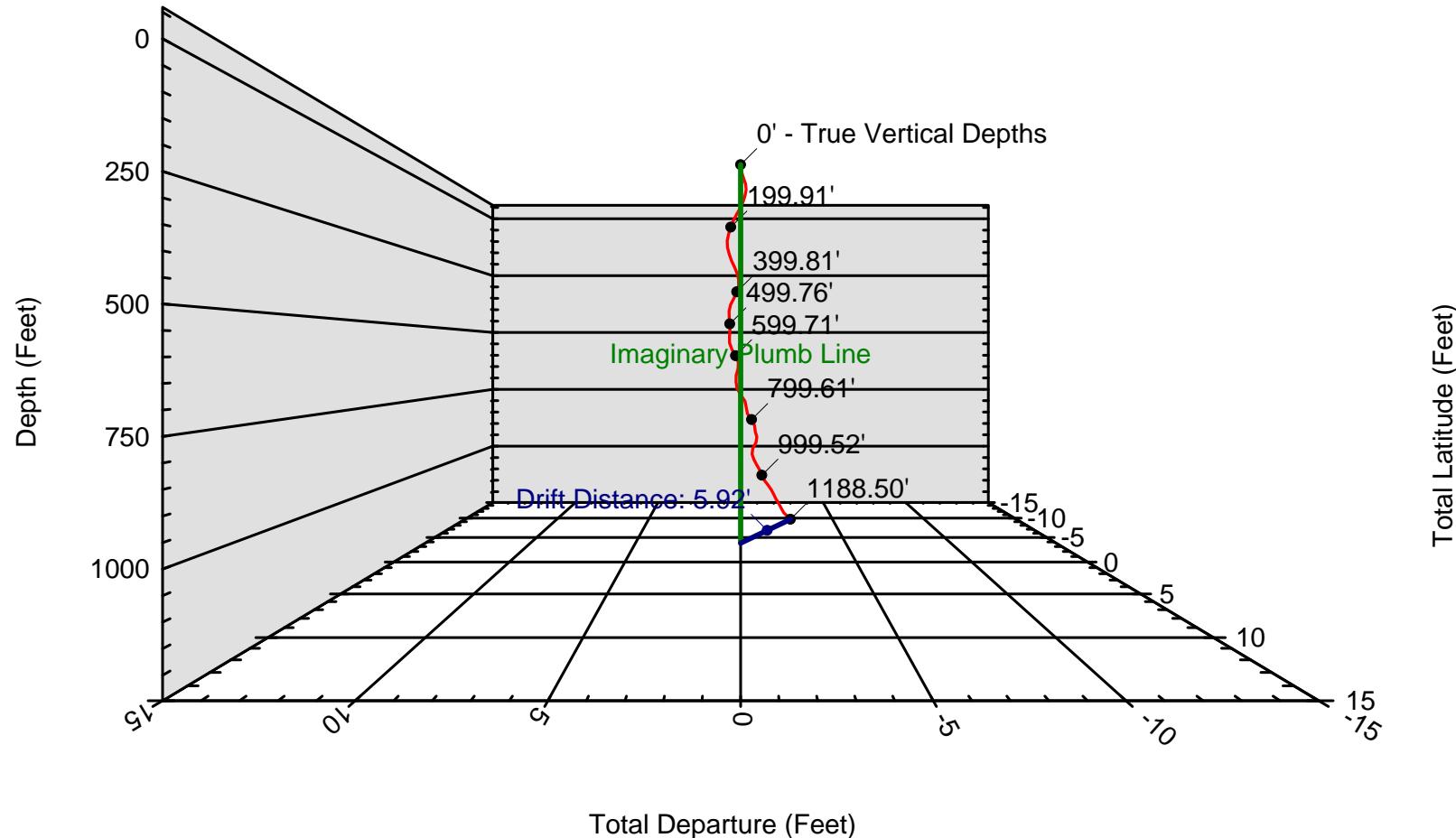
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3D PROJECTION VIEW - R-09

Florence Copper
Florence Copper

Drift Distance = 5.92 Feet Drift Bearing = 204.6 Degrees True Vertical Depth = 1188.50 Feet

0.0



Date of Survey: Monday - May 7, 2018

Balanced Tangential Calculation Method

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POLAR VIEW - R-09

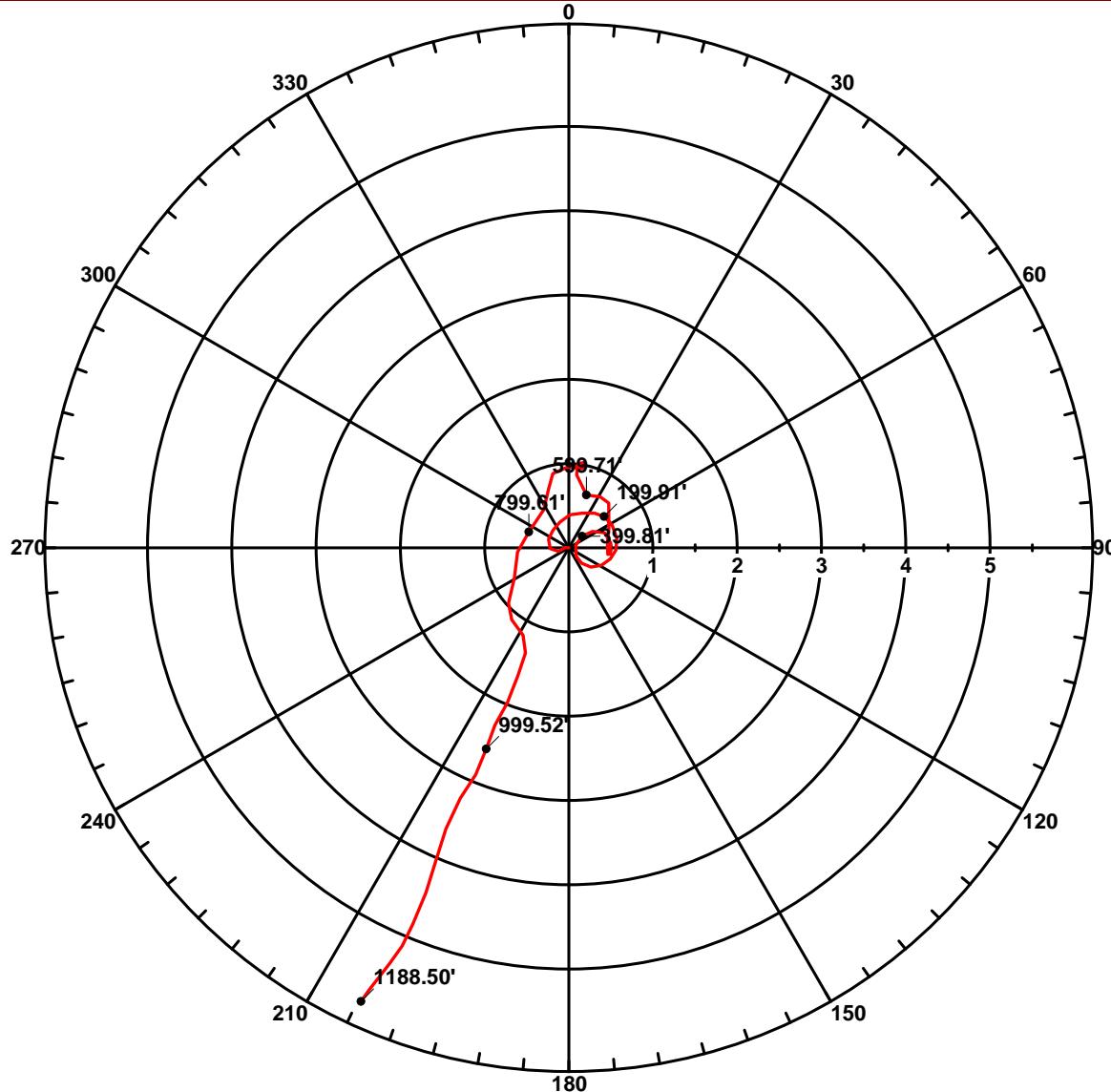
Florence Copper

Florence Copper

Drift Distance = 5.92 Feet

Drift Bearing = 204.6 Degrees

True Vertical Depth = 1188.50 Feet



Date of Survey: Monday - May 7, 2018

Balanced Tangential Calculation Method

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EASTING RECTANGULAR VIEW - R-09

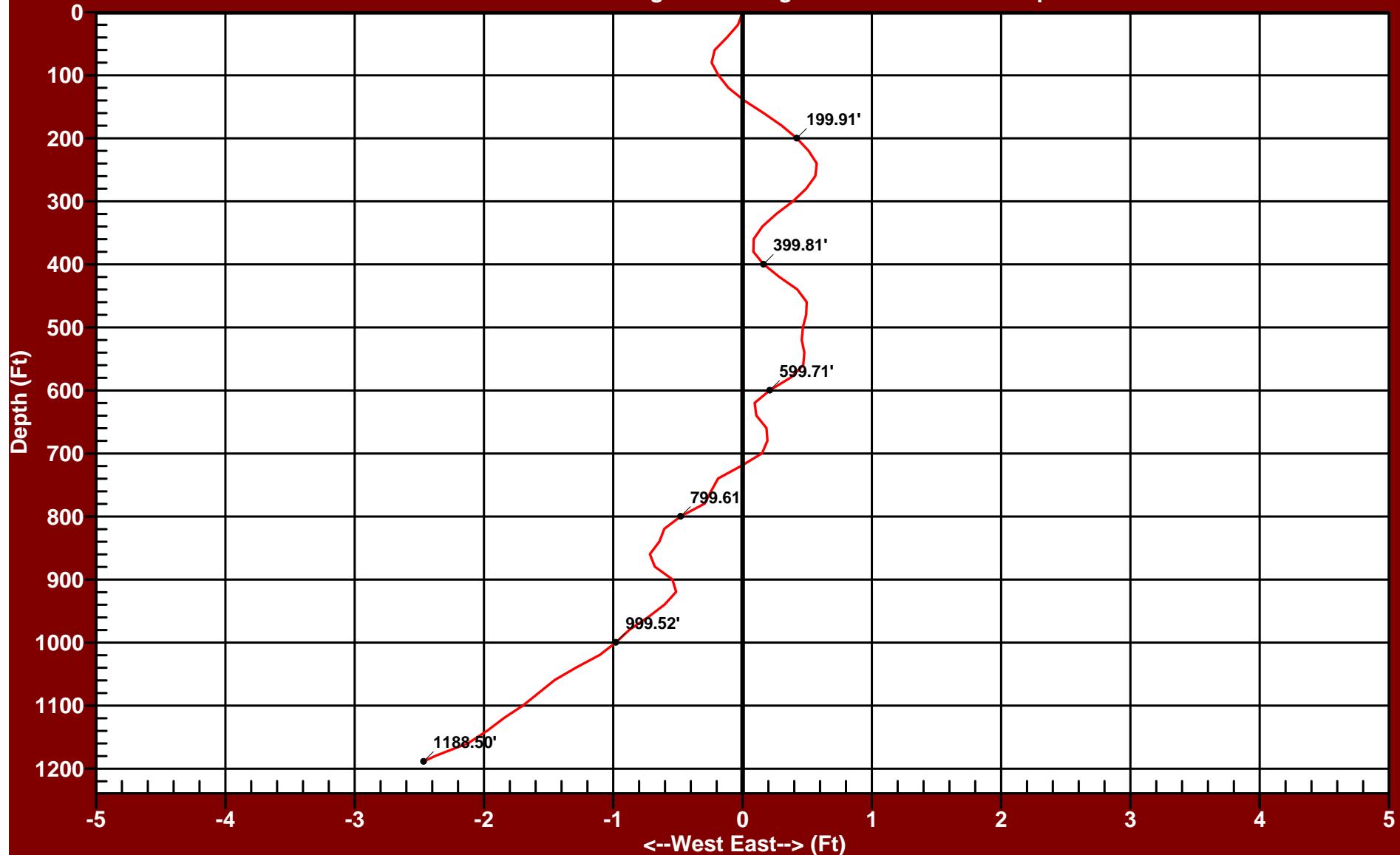
Florence Copper

Florence Copper

Drift Distance = 5.92 Feet

Drift Bearing = 204.6 Degrees

True Vertical Depth = 1188.50 Feet



Date of Survey: Monday - May 7, 2018

Balanced Tangential Calculation Method

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NORTHING RECTANGULAR VIEW - R-09

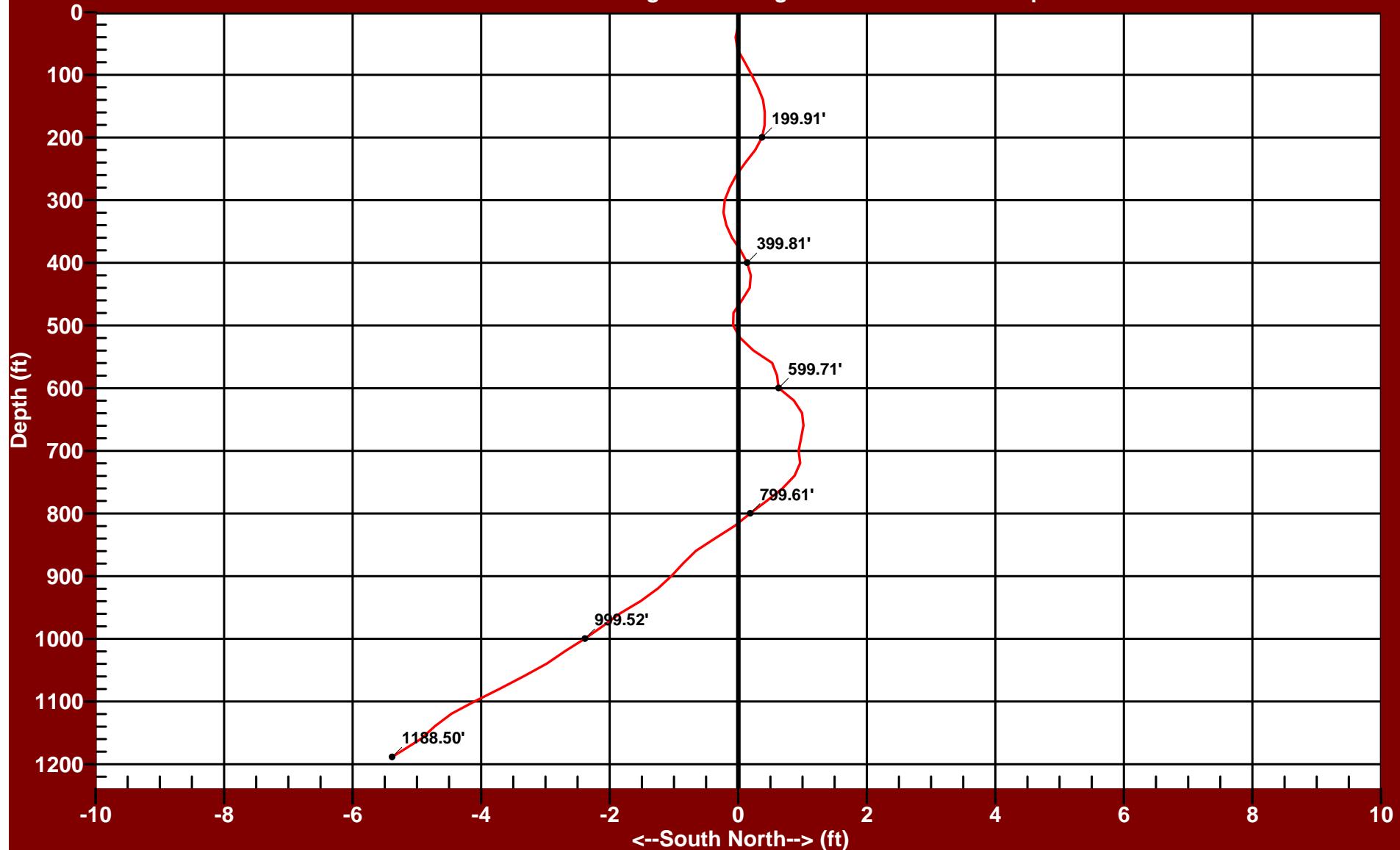
Florence Copper

Florence Copper

Drift Distance = 5.92 Feet

Drift Bearing = 204.6 Degrees

True Vertical Depth = 1188.50 Feet



Date of Survey: Monday - May 7, 2018

Balanced Tangential Calculation Method

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